Classified

RATES: Fifty words or less, one insertion, $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

SALES ENGINEER WANTED. Prominent manufacturer of automatic control equipment has several openings for sales engineers. Previous University training or experience in air conditioning and heating, and an acquaintanceship with architects and engineers is essential. Box 774, Electric Refrigeration News.

WANTED: Commercial refrigeration men. Are you looking for an excellent opportunity to make full use of your training and experience in commercial refrigeration? This advertiser (a manufacturer) has openings for several capable men who know the commercial business thoroughly. Must be able to sell, teach men how to sell, organize and manage territories and make them produce. Our own employees know of this ad. Give full information in first reply which will be held strictly confidential. Box 797, Electric Refrigeration News.

POSITIONS WANTED

TEN YEARS' successful experience in refrigeration, heating and air conditioning in New York metropolitan district. Available June 1st. Well and favorably known among dealers, builders and architects. Want manufacturer connection as district sales manager for substantial line in metropolitan district. Would consider other territory. Particularly adept in building dealer and direct sales organization. Box 792, Electric Refrigeration News.

THIRTY-YEAR-OLD married man, R.A.C.I. trained, with one and one-half years' commercial sales engineering and estimating experience and with excellent knowledge of air conditioning application, estimating, etc., wants job with aggressive manufacturer or jobber. Well educated, good personality, conscientious and capable. Reply to Box 799, Electric Refrigeration News.

EQUIPMENT FOR SALE

REFRIGERATOR DEALERS! Make money with Federal's reconditioned refrigerators, 1000 refrigerators such as Frigidaire, G. E., Kelvinator, Electrolux, etc., completely remanufactured and rebuilt, some as is, as low as $15; also hundreds of new refrigerators priced for promotional purposes. Federal Refrigerator Corp., 57 East 25th St., New York.

BRAND NEW PARTS. Manufacturers' closeouts—fully guaranteed one year. Detroit Lubricator thermostatic expansion valves, model 673 flange type, $3.95, equipped with S.A.E. fitting $4.45. Detroit Lubricator solenoid valves, model 682, $3.95. "Automatic" model No. 71 solenoid water valves $3.75. Model No. 73 R $3.75. Mullins 3 tray evaporators in all porcelain, complete with porcelain front and porcelain suspension plate trays, etc., $6.95. Hundreds of other exceptional buys, as well as a complete line of standard nationally advertised parts, at drastic price reductions. Write for our catalog. Federal Refrigerator Corporation, 57 East 25th Street, New York City.

EXTRA SPECIAL: New Servel refrigeration twin cylinder compressors ⅓ H. P. complete on base with copper container. Especially adaptable for six hole ice cream cabinets. Less motor. For quick clearance $22.50. Pioneer Refrigeration Equipment, 33 Warren Street, New York City.

NEW SIX HOLE double ice cream cabinets sacrifice price only $33.00. Special 10% discount in lots of two or more. Cabinets are in original crates. Direct expansion type built-in coils. Stainless steel tops. Well insulated. Send for refrigeration bargain list. Pioneer Refrigeration Equipment, 33 Warren Street, New York City.

REPAIR SERVICE

MAJESTIC UNITS, any model, standard or hermetic, rebuilt or exchanged $17.50. Any household model G.E. rebuilt $22.50. All model Majestics in stock for prompt exchange. All prices F.O.B. Chicago and guarantee six months. Wholesale only. Refrigeration Products, Inc., 122 W. Illinois St., Chicago, Ill.

FRIGIDAIRE plain T two temperature valves $2.50. Mercoid No. 848 controls complete with tube $5.00. Try Warrenol for stuck-up compressors. Samples available. Thermostats, float valves, and expansion valves rebuilt. Prompt service. Same day shipment on refrigerant gases. Halectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

MAJESTIC UNITS repaired $17.50. General Electric units, $30.00. Send your Majestic units to Ft. Smith and get them fixed right. We positively guarantee that we can make Majestics freeze as fast as when new. Peno Service Co., Ft. Smith, Ark.

GENERAL ELECTRIC sealed units repaired, rebuilt, exchanged, $19.50 up. Majestic sealed units repaired, rebuilt, exchanged, $17.50 up. Largest shop and best equipped in the country. Satisfied customers in every part of the United States. Ship to us. Immediate service. Also U. S. Hermetics. Wholesale only. Refrigerator Engineering Parts & Service Co., 2800 So. Parkway, Chicago, Ill.

SCHOOLS

PRACTICAL REFRIGERATION TRAINING at Universal. Learn by doing. Training on commercial, domestic equipment. Hundreds of units and refrigerators to work on, including repairs to valves, controls, motors, compressors that qualified men for jobs in refrigeration and air conditioning industry. Free folder. Universal Refrigeration Engineering School, 352 Fourth Avenue, New York.

Questions

Gibson Refrigerators

No. 2748 (Dealer, North Carolina)—"I have just seen a copy of your publication, REFRIGERATION NEWS, and feel that such a publication might be of great benefit to us.

"Will you kindly send us the April 1 issue and enter our subscription for one year. My understanding is that you go to press weekly and the yearly subscription rate is three dollars. Kindly advise regarding this and we will forward our check to cover.

"In connection with refrigerators we would like to know if you have any information on the Gibson line out of Greenville, Mich. As we are planning to take this line on will appreciate your sending us anything special you have on this product. Especially we would like to know whether they make their own mechanical unit or whether they have someone else make it, and if so, who?"

Answer: The Gibson Electric Refrigerator Corp. has been manufacturing this refrigerator for a number of years.

More detailed information about the machine is contained in the household refrigerator specifications issue of ELECTRIC REFRIGERATION NEWS of April 22, 1936, and their advertisement in the same issue.

Milk Cooler Parts

No. 2749 (Dealer, Ontario)—"We are contemplating manufacturing or assembling electrical coolers for milk, and would be very pleased if you would advise us the names of two or three manufacturers of compressors, coils, and condensers, in the United States.

"Doubtless there are some companies making a specialty of these, and we would appreciate this information."

Answer: Manufacturers of condensing units are as follows:

American Engineering Co.
2420 Aramingo Ave., Philadelphia, Pa.

Baker Ice Machine Co.
1518 Evans St., Omaha, Nebr.

Carbondale Machine Corp.
Harrison, N. J.

Copeland Refrigeration Corp.
1331 Holden Ave., Detroit, Mich.

Curtis Refrigerating Machine Co.
1936 Kienlen Ave., St. Louis, Mo.

General Refrigeration Sales Co.
Beloit, Wis.

Kellogg Manufacturing Co.
97 Humboldt St., Rochester, N. Y.

Merchant & Evans Co.
21st & Washington Ave., Philadelphia, Pa.

Reliance Refrigerating Machine Co., Inc.
3401 N. Kedzie Ave., Chicago, Ill.

Servel, Inc., Evansville, Ind.

Brunner Manufacturing Co.
1821 Broad St., Utica, N. Y.

Tecumseh Products Co.
Tecumseh, Mich.

Universal Cooler Corp.
7424 Melville Ave., Detroit, Mich.

Manufacturer of coils are listed below, as follows:

Bush Manufacturing Co.
100 Wellington St., Hartford, Conn.

Fedders Manufacturing Co.
57 Tonawanda St., Buffalo, N. Y.

Filtrine Manufacturing Co.
53 Lexington Ave., Brooklyn, N. Y.

G & O Manufacturing Co.
138 Winchester Ave., New Haven, Conn.

Long Manufacturing Co.
2768 E. Grand Blvd., Detroit, Mich.

McCord Radiator & Mfg. Co.
2587 E. Grand Blvd., Detroit, Mich.

Peerless Ice Machine Co.
515 W. 35th St., Chicago, Ill.

Refrigeration Appliances, Inc.
1342 West Lake St., Chicago, Ill.

Rempe Fin Coil Co.
340 N. Sacramento Blvd., Chicago, Ill.

Trenton Auto Radiator Works
626 Brunswick Ave., Trenton, N. J.

Larkin Refrigerating Corp.
519 Fair St., S. E., Atlanta, Ga.

'Orphan' Washers?

No. 2750 (User, Michigan)—"Could you please furnish me with the following information: When was the Victor Mfg. Co., Leavenworth, Kan., in operation? Also if possible, when the electric "Wonder Washer and Wringer No. E 5517" made? If you do not have this information, do you know where I might get it? It is very important, to me."

Answer: We would suggest that you write to the American Washing Machine Manufacturers Association, 80 E. Jackson Blvd., Chicago, Ill.

Large Ice Makers

No. 2751 (Exporter, New York)—"We thank you for yours of the seventh, submiting list of manufacturers, but apparently you have misunderstood our inquiry since the evaporators we are interested in are the larger cube ice makers, such as are used commercially, and not the small domestic evaporators. Can you help us out on these?"

Answer: Manufacturers of ice makers in commercial sizes are listed on pages 206 and 207 of the REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Refrigeration Statistics

No. 2752 (Investment House, New York)—"Mr. William B. Henderson, executive vice president of Refrigerating Machinery Association has told us that you might be willing to give us some statistical information and figures on the volume of refrigeration for a number of years past and we herewith address you for the purpose of inquiring whether you would be good enough to let us have these figures.

"We assure you that any information which you can give us will be held in strictest confidence."

Answer: The 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK presents all the known statistical facts about the refrigeration and air conditioning industries through the year 1934, including an analysis of the market and a survey of distributive channels.

Total sales of the manufacturers by years are given in both units and dollar volume for the years 1920 through 1934. This book sells for $3 a copy.

Nema Compressor Ratings

No. 2753 (Manufacturer, Wisconsin)—"Will you please send us the new N.E.M.A. ratings on compressor capacities?"

Answer: Complete information on the new methods of rating commercial refrigeration compressors was published in the Nov. 6 and 13 issues of ELECTRIC REFRIGERATION NEWS. Back issues of the NEWS are obtainable at a cost of ten cents per copy.

Specifications of 1936 models of commercial condensing units of all leading makes, including capacities, were published in the May 6 issue of ELECTRIC REFRIGERATION NEWS.

Flake Ice Equipment

No. 2754 (Dealer, California)—"Please send us by return mail the names and addresses of manufacturers making Flake Ice Equipment, as we are in need of some equipment of this sort."

Answer: Flake Ice equipment is made by the Flakice Corp., 185 Montagne St., Brooklyn, N. Y.

Sales of Different Makes

No. 2755 (Manufacturer, Colorado)—"In your interesting publication, 1935 REFRIGERATOR AND AIR CONDITIONING MARKET DATA you show the number of refrigerator and washing machine units sold over a period of time and you also show these sales broken down by states 1930 to 1934.

"At the present time our refrigerator and washing machine belt jobbers are carrying stocks which cover requirements but due to lack of information as to the popularity of individual makes by states, these stocks are much larger than they should be. If it is possible to secure the information we should like very much to have a further break down of the sales by states into the various makes of refrigerators and washing machines.

"We shall appreciate hearing from you as to whether or not you can supply this data."

Answer: We regret that we cannot furnish you with any further break down of refrigerator sales than is published in the REFRIGERATION AND AIR CONDITIONING DATA BOOK, as the manufacturers do no make their individual sales figures public.

Sherer-Gillett Cases

No. 2756 (Distributor, Louisiana)—"If possible, kindly furnish us with the name and address of the manufacturer of the Sherer Gillette Display Case."

Answer: The Sherer-Gillett case is made by the Sherer-Gillett Co., Kalamazoo Ave., Marshall, Mich.

Ice Box Sales

No. 2757 (Manufacturer, Ohio)—"In your last Year Book, the latest figures you show on ice-box sales are 1933-34. Have you any additional information on the subject of ice-box sales?

"Any current data you can give us on the subject of what's going on in the ice-box industry, particularly from the sales standpoint as concerns the various major markets, will be greatly appreciated."

Answer: We suggest you contact the National Refrigerator Manufacturers Association, 205 W. Wacker Drive, Chicago, Ill.

Surge Tanks

No. 2758 (Jobbers, New York)—"We are unable to locate in your directory a listing of Surge tanks. Will you be kind enough to advise us the names of manufacturers to whom we can refer for prices, delivery, etc."

Answer: The only manufacturers we know of making surge tanks are Filtrine Mfg. Co., 53 Lexington Ave., Brooklyn, N. Y., and Temprite Products Corp., 1349 E. Milwaukee Ave., Detroit, Mich.

The Buyer's Guide

Special rates apply to this column only. Write Advertising Dept. for full information.

Send Today for HARRY ALTER'S NEW 1936 Catalog
Showing America's Biggest Line of
REFRIGERATION PARTS AND SUPPLIES

We are large, dependable refrigeration supply distributors carrying a large stock of nationally known parts and supplies. All shown in a new complete net price catalog—gladly sent on request to refrigeration dealers and service companies. Write today on your letter-head.

FOR ALL MAKES — AIR CONDITIONING AND COMMERCIAL

The HARRY ALTER CO. Inc. Main Offices 1728 S. Michigan Ave. Chicago, Ill.

We Carry a Most Complete Line of
Refrigeration Supplies

RSD

Send Your Orders TODAY!!

Federal 1173 — STRICTLY WHOLESALE

STARR FREEZE Replacement Compressors

Condensing Units

All Orders Shipped SAME DAY!

REFRIGERATION SUPPLIES DISTR.

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912-12th St. Sacramento

FOR THE CONVENIENCE OF THE REFRIGERATION TRADE

PARTS SUPPLIES TOOLS
Refrigeration & Air Conditioning
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No matter what parts, supplies or tools you may need for any type of refrigerator or air conditioner, our COMPLETE LINE can meet your requirements promptly. All QUALITY MERCHANDISE. Deal with Airo; you can rely on getting exactly what you order. Airo prices are lowest wholesale prices obtainable. Orders are shipped the same day received. WRITE FOR NEW, COMPLETE CATALOG. It's FREE.

Send for BIG FREE CATALOG

AIRO SUPPLY COMPANY 408-10 N. Wells St. Chicago, Ill.

HENRY FLARING TOOL

The flaring tool that is the fastest and easiest to operate! Sturdy and lasts longer. Adjustable cam lever locks the tube in place in carbonized clamping blocks. Greatest locking pressure is always exerted directly opposite the tube. For ¼", 5/16", ⅜", ½", and ⅝" tubing. Each, $4.55.

HENRY VALVE CO.
1001-19 N. Spaulding Ave., Chicago, Ill.

IF YOUR JOBBER CAN'T SUPPLY YOU, ORDER DIRECT

Type X

DELIVER YOUR REFRIGERATORS ON RUBBER

***The* DAYTON CARRIER TRUCK**
Will not mar — Speeds delivery

Type X - 53" long — Type Y - 70" long, both with 8 inch rubber tired wheels. Fitted with movable foot or with permanent wide foot for skirted bottom cabinets.

Type X with one strap and either foot - $17.00
Type Y with one strap and either foot - $18.50
f. o. b. Dayton

Write for Bulletin

INTERNATIONAL ENGINEERING INC.
Dayton, Ohio 15 Park Row, N.Y.

BOUND VOLUMES OF THE NEWS

Each of the following volumes contains all weekly issues of Electric Refrigeration News issued during a period of four months. Stiff paper board covers.

Vol. 8—Jan. 4 to April 26, 1933. (Serial Nos. 198 to 214.)
Vol. 9—May 3 to Aug. 30, 1933. (Serial Nos. 215 to 232.)
Vol. 10—Sept. 6 to Dec. 27, 1933. (Serial Nos. 233 to 249.)
Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)
Vol. 12—May 2 to Aug. 29, 1934. (Serial Nos. 267 to 284.)
Vol. 13—Sept. 5 to Dec. 26, 1934. (Serial Nos. 285 to 301.)
Vol. 14—Jan. 2 to April 24, 1935. (Serial Nos. 302 to 318.)
Vol. 15—May 1 to Aug. 28, 1935. (Serial Nos. 319 to 336.)
Vol. 16—Sept. 4 to Dec. 25, 1935. (Serial Nos. 337 to 353.)
Vol. 17—Jan. 1 to April 29, 1936. (Serial No. 354 to 371.)

Price $3.00 per volume, f.o.b. Detroit. Shipment will be made by express collect unless otherwise specified. Please send remittance with order.

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

KASON HARDWARE

Serving Refrigerators the World Over

→ Manufacturers of Fine Refrigerator Hardware ←

KASON HARDWARE CORP., 127-137 Wallabout St., Brooklyn, N.Y.

THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

WRITTEN TO BE READ ON ARRIVAL

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS.

VOL. 18, NO. 3, SERIAL NO. 374
ISSUED EVERY WEDNESDAY

Entered as second-class matter Aug. 1, 1927

DETROIT, MICHIGAN, MAY 20, 1936

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SPECIFICATIONS ISSUE
25 CENTS PER COPY

Sales Gain 43% In Philadelphia Area in Quarter

13,857 Household Units Sold in Three Months at Average Price of $179

PHILADELPHIA—Members of the Electrical Association of Philadelphia sold 13,857 refrigerators during the first three month of 1936, a 43% increase over the 9,709 sold during the same period in 1935, reports George R. Conover, managing director of the association.

The average unit price was $179. March provide to be best month of the three on the average, as it did in both 1935 and 1934; however, the greatest percentage increase for 1936 so far over a corresponding month in 1935 came in January with 2,532 units sold, or a 252% gain over the 718 sold in January, 1935.

Although the average unit price for 1935 and 1936 was exactly the same for the three months, the retail value

(Concluded on Page 21, Column 1)

Grunow Radios to Be Shown to Distributors At Meeting June 4-5

CHICAGO—General Household Utilities Co. distributors and their field salesmen, service men, representatives, and key dealers will be given their first look at the new Grunow radio models for 1937 at a meeting Thursday and Friday, June 4 and 5, in the Blackstone hotel here.

At the request of President William C. Grunow, distributors will bring their dealer and prospective dealer lists with them. Literature describing the new models will be sent to these lists direct from the convention.

Crosley Demonstrates Improvements in Radios for '37

CINCINNATI—New developments in Crosley radio products were demonstrated to approximately 150 officials and distributors' representatives at the advance showing of the new 1937 Crosley radio receivers May 8 in the studios of WLW at Crosley's factory.

The "Phantom Conductor," or auto expressionator, introduced in radio receivers by Crosley early this year, has been refined so that it now embodies a full sized radio tube instead of two small bulbs.

This phantom conductor, the makers claim, not only restores the volume and expression range of music that in case of crescendos and fortissimos must be monitored out, or suppressed by the orchestra leader in broadcasting, but it amplifies the expression to the fullness with which the composer intended the music should be played.

Another feature demonstrated at the showing was the bass compensator that automatically strengthens the bass notes as the music becomes softer so that at all volume levels the bass notes, which become inaudible first, are maintained at their proper level.

The "Mystic Hand" which automatically tunes the receiver to the proper place on the dial was explained. This feature is also designed to reduce inter-station noises, and compensate

(Concluded on Page 2, Column 1)

Halbert P. Hill, Consulting Engineer, Dies

NEW YORK CITY—Halbert P. Hill, 112 West 42nd St., a consulting engineer in the refrigeration field for many years, died Tuesday, May 19, following a brief illness. Funeral services were to be held in New York City today, with burial tomorrow in Washington, D. C.

Mr. Hill was a member of the firm of Ophuls & Hill, and was, for many years, consulting engineer for the Anheuser-Busch Brewing Co., St. Louis.

Shreveport Dealer Sells 100 Tons of Cooling This Year

SHREVEPORT, La. — Interstate Electric Co., Kelvinator dealer, has sold more than 100 tons of comfort cooling equipment in this town of 80,000 population, probably the outstanding air-conditioning sales job so far this year for cities of comparable size.

R. A. Querbes is president of the company, and J. A. Lee is salesmanager.

Biggest job on Interstate's 1936 installation list is a 50-ton system for the Southwestern Gas & Electric Co. office building. All offices in the building are to be conditioned by means of a central-station set-up.

A 20-ton system is going into the Subway Billiard Parlor. Conditioning is accomplished through a duct system, in which remote units are employed.

The Turf Club will be cooled by a 10-ton suspended unit. A suspended unit of 7½-tons cooling capacity is going into Mike & Harry's bar.

The office of a Doctor Butler is being equipped with a 5-ton floor type unit. The Arkansas Natural Gas Co. offices are adding a 3-ton unit to their existing installation.

One of the latest jobs is an installation for a broker's office in the Querbes and Boquin office building.

Salesmanager Lee has been responsible for the sales of most of the jobs. Proud is he of the fact that all the jobs have brought a profit.

Installation by Interstate Electric in 1935 of a 100-ton system for the 10-story City Bank Building gave air conditioning a real impetus in Shreveport, and Mr. Lee an installation worth showing to prospects.

15 & 20-Ton Machines In Production at Servel Factory

EVANSVILLE, Ind. — The Servel factory here is in production on its new 15 and 20-ton Vee-type refrigerating machines for air conditioning, and orders on hand from distributors are being filled as rapidly as possible, reports Harry Newcomb, general manager of the commercial division.

The new series of machines carries a 90° Vee-type four-cylinder compressor mounted with the motor on a rigid structural steel base. The compressor follows the general design of previous Servel models featuring "sealed crankcase" construction with truncated long skirt pistons and suction port oil separation, water-cooled heads, and copper-lead bearing construction throughout. A reciprocating pump on the crankshaft provides forced lubrication to all bearings.

The multi-pass condenser is concealed in the base, and according to Servel engineers, has certain features that are unique. It retains the important features of the double-tube counter-flow condensers used on smaller

(Concluded on Page 5, Column 1)

AIR CONDITIONING NEWS IN THIS ISSUE

Specifications data on 30 makes of air conditioners which have a cooling function start on page 4.

American Blower	12	McCord	11
Baker	6	McQuay	14
Buffalo Forge	16	Miller	16
Carbondale	16	Nelson	16
Crosley	14	Norge	9
De La Vergne	15	Pearless	13
Delco-Frigidaire	8	Sturtevant	16
Electrol	11	Servel	8
Fairbanks Morse	8	Strang	18
Fedders	4	Synchromatic	19
General Electric	6	Thermal Units	12
Ilg	10	Trane	12
Kauffman	13	Westinghouse	8
Kelvinator	4	Williams	16
Lipman	10	Zephyr Air	18

Cost of home cooling with various types of refrigerating mediums as determined by tests at the University of Illinois Research Residence. Page 11.

Selecting air-conditioning equipment on the basis of psychrometry and heat transfer principles. Page 13.

Detroit heating contractors shun refrigeration work in air-conditioning installations. Page 5.

Other Specifications Issues of the News

HOUSEHOLD
April 22
COMMERCIAL
May 6

Extra copies of each specifications issue are available. Price 25 cents per copy. Please enclose remittance with order.

Who Can Sell Air Conditioning?

One of the biggest problems facing the air-conditioning industry—finding salesmen to sell the equipment, is discussed editorially on page 20, and some suggestions are offered for a possible solution.

Five-Year Financing Offered Apartments in New York City on Refrigerator Purchases

NEW YORK CITY—To increase the use of electric refrigeration in New York City apartment buildings, Electrical Association of New York, Inc., in cooperation with refrigerator manufacturers, distributors, public utilities, and National City Bank, has set up a new financing plan with terms as long as five years, and interest as low as under the Federal Housing Administration plan.

Refrigerators announced as eligible in the campaign are: Coldspot, Crosley, Frigidaire, General Electric, Kelvinator, Leonard, Norge, Sparton, Stewart-Warner, and Westinghouse. Products used in the drive, in addition to meeting certain performance standards, were also required to carry five-year warranties.

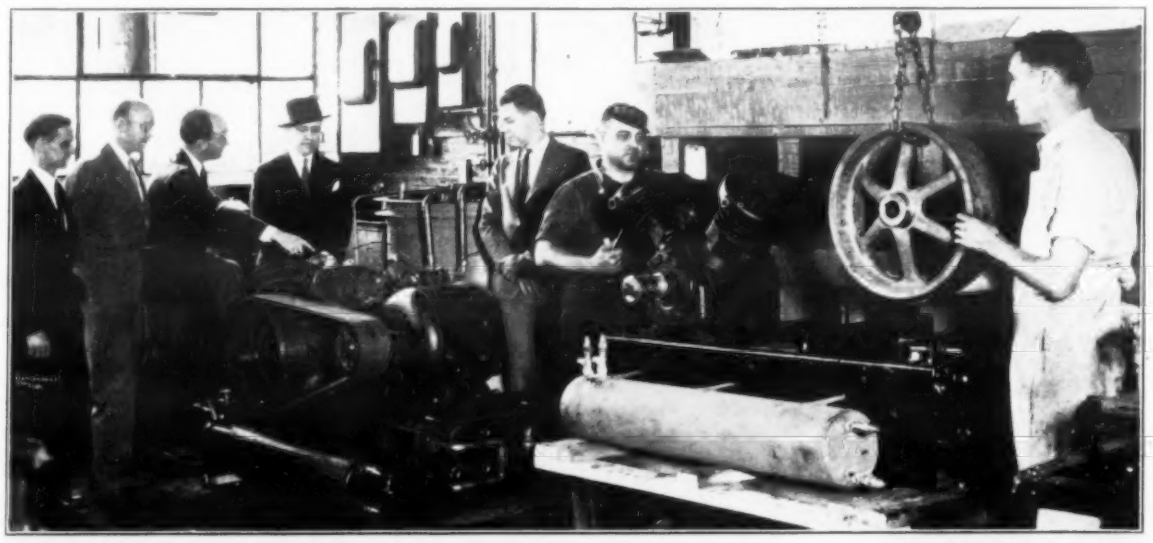
The plan provides for the installation of mechanical refrigeration by apartment house owners on terms so low that costs may be paid from the operating income of the properties rather than from capital, according to claims made by those sponsoring the plan.

Financing costs have been reduced by cooperative efforts of manufacturers, distributors, and utilities to reduce credit risk. Rates vary according to the amount and term involved.

Credit on sales under the plan will be provided by the National City Bank, through its personal loan department, by special arrangement through the Electrical Association with distributors and utility companies. The bank will handle monthly payments in the same manner in which it formerly handled personal and FHA modernization loans.

While the plan at present applies only to apartments installing five or more electric refrigerators, a companion plan will be provided soon to cover ranges, washers, ironers, water heaters, and other major appliances.

Servel President Inspects New 20-Ton Unit



Harry Newcomb, general manager of Servel's commercial division, points out to President Louis Ruthenburg the features of one of the first Servel 20-ton air-conditioning machines to come off the production lines. In the group are: O. J. Dail, superintendent; W. J. Aulsebrook, assistant sales manager; C. E. Ploeger, chief engineer.

Air Conditioner March Bookings Are $3,477,752

Increase 33% Over Feb; Remote-Type Units Show Largest Gain

WASHINGTON, D. C.—Orders for air conditioning, blower fans, and unit heater equipment booked during March totaled $3,477,752, a gain of 33.2% over the $2,611,241 in orders booked during February, according to reports by 98 manufacturers released through the office of Director William L. Austin of the Bureau of the Census.

During the first quarter, orders booked in all classes total $8,402,527, of which $3,922,330 is for air-conditioning equipment alone.

The air-conditioning group—which includes unit systems, central station systems, refrigeration equipment for air-conditioning systems, air washers, filters, and humidifiers—booked orders during March totaling $1,958,786, a gain of $748,000 over the $1,111,586 in orders booked in February.

With the exception of humidifiers, which dropped from $79,401, the February total, to $43,401, all divisions of the group showed sizeable gains.

Leading this increase were unit systems not self-contained, orders for which jumped from $192,763, the February total, to $639,665 in March. Self-contained systems also registered

(Concluded on Page 7, Column 2)

ASHVE Announces Technical Program For June Meeting

BUCK HILL FALLS, Pa.—With the exception of their joint session with American Society of Refrigerating Engineers on air conditioning, heating problems will occupy the attention of members of American Society of Heating & Ventilating Engineers at their 1936 semi-annual meeting, to be held here June 22 to 24.

Program for the joint meeting with A. S. R. E. members, scheduled for the morning of Tuesday, June 23, was published in last week's issue of ELECTRIC REFRIGERATION NEWS.

Social events include a steak fry with A. S. R. E. members on Skytop mountain Monday evening, June 22, and the annual A. S. H. V. E. banquet and dance at the Inn here Tuesday.

Technical session will open at 9:30 a.m. on June 22, with presentation of the following papers:

"Corrosion Studies in Steam Heating Systems," by R. R. Seeber, F. A. Rohrman, and G. E. Smedberg.

"Performance of Under-Feed Domestic Stokers Burning Bituminous Coal," by T. G. Estep.

"Relative Absorption of the Various Sections of a Round Heating Boiler," by A. J. Johnson.

Tuesday's joint meeting with A. S. R. E. will be held at Skytop, with Willis H. Carrier presiding.

Final technical session Wednesday morning, June 24, will include:

"Development of Testing Apparatus for Thermostats," by D. D. Wile, Detroit Lubricator Co.

"Pyrheliometers and the Measurement of Total Solar Radiation," by L. A. Harding.

"Field Tests to Determine the Heat

(Concluded on Page 9, Column 4)

Kelvinator Appoints Two New Distributors for Air Conditioning Line

DETROIT — Kelvinator Corp. recently appointed two new commercial air conditioning distributors and one mercantile distributor, reports J. A. Harlan, manager, commercial sales division of Kelvinator.

In Ashland, Ohio, the Smith Music Store will handle standard commercial, liquid cooling, and automatic heating units. In addition to these lines, E. W. Heintz Co., of Akron, will carry junior air conditioning units and room coolers.

Waterman-Waterbury Co. was appointed mercantile distributor for complete air-conditioning units exclusively at Minneapolis., Minn.

Distributors Report Large Sales Gains At Crosley Meeting

(*Concluded from Page 1, Column 1*)

for frequency drift of the oscillator circuit.

The new models, which include radios from five to thirteen tubes, were introduced to the group by president Powel Crosley, Jr.

Mr. Crosley told the distributors that Crosley sales for the twelve month period ending March 31, were the largest in the company's history, and that each month of the current year had broken all previous records for corresponding periods.

With Crosley production now as high as 2,000 radios in one day, Mr. Crosley predicted that the demand, intensified as the presidential campaign continues, will probably necessitate stepping up production to the company's capacity of 5,000 a day.

Nearly Half Obsolete

"Of the 25,550,000 radio sets estimated to be in use in the United States by the Bureau of Foreign and Domestic Commerce of the United States Department of Agriculture, 43% are said to be five years or more old," Mr. Crosley said. "With the great strides that are being made in radio receivers, it is obvious that the vast majority of radio receivers in use today are obsolete."

At the advance showing, improvements in the Crosley Cool-rest, air-conditioned bed, were demonstrated, and other company products, including refrigerators, washers, and bottle coolers, were shown.

Other officers who addressed the meeting included: Lewis M. Crosley, vice president and general manager; Thomas W. Berger, general sales manager; J. P. Rogers, and Powel Crosley III, vice presidents; Neil Bauer, manager of special products division; and Glenn H. Corbett, advertising manager.

Sales Greatly Increased

Distributors at the meeting without exception reported improved business conditions and greatly increased sales.

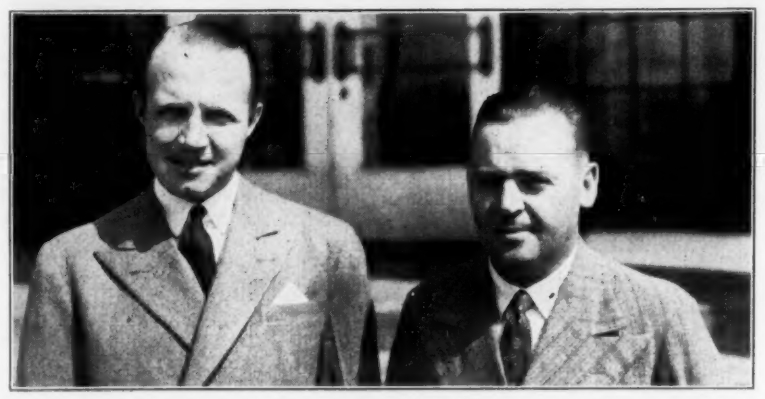
A 377% increase in refrigerator sales in April over the corresponding month in 1935 was the record established by James E. Johnson, president of Cooper-Louisville Co., Louisville, Ky.

V. H. Maurer, president of Maurer-Greusel Co., Milwaukee, said that that company's sales of refrigerators are running 20% ahead of those of a year ago. Similar business increases were reported by F. M. Hutchinson, president of Motor-Power Equipment Co., Minneapolis, and John Leven, president of Tarbell-Watters Co., Springfield, Mass.

In Iowa, Herbert Hieb, president of Hieb Distributing Co., says that refrigerator sales are running 50 to 75% ahead of those of 1935.

E. H. Rogers, president of Consolidated Automotive Equipment Co., Jacksonville, and C. A. Pound, president of Baird Hardware Co., Gainsville, Fla., reported that business conditions in Florida are the best in years.

From South Africa to Dayton



J. A. Russell, Frigidaire export division's field representative in South Africa (at left), and M. J. Stranack, Frigidaire distributor in Durban, South Africa, visited the Frigidaire factories in Dayton last week. Mr. Russell has been located in South Africa for about two years, having previously been connected with the Dayton sales district. Prior to this he was in Europe with Frigidaire's regional office.

Export Reports Show Gain in Refrigerator Shipments for 1935

WASHINGTON, D. C.—Comparative figures on the export of household electric refrigerators for the years 1929, 1932, 1934, and 1935, issued by the Bureau of Foreign and Domestic Commerce of the Department of Commerce, show that shipments last year exceed 1934 figures by 18.8% in number, and by 14.6% in dollar volume.

The figures were released in connection with the observation of National Foreign Trade Week, May 17 to 24, to show the importance of foreign commerce in our national life.

Our foreign trade in 1935 was greater than in any year since 1931, the report shows. Value of the trade was $4,329,000,000.

Exports of household refrigerators, the report shows, totaled 120,000 in 1935, for a volume of $9,400,000. This compares with 101,000 refrigerators in 1934, for $8,200,000; 38,000 in 1932, for $3,400,000; and 62,000 in 1929, for $9,900,000, high dollar volume year.

Ratio of 1935 export business (per cent) to previous years, figuring last year's totals as 100%, are as follows:

1928: shipments, 193.5%; dollar volume, 94.4%. 1932: shipments, 315.8%; dollar volume, 276.5%. 1934: shipments, 118.8%; dollars, 114.6%.

Babson to Head Retail Sales For Harrison Co.

NEWARK—T. E. Babson, formerly sales promotion and advertising manager for P. H. Harrison Co., General Electric distributor, has been placed in charge of the retail department.

Mr. Babson will continue to do the advertising and sales promotion for that department, and John Eick, Jr. will be in charge of those functions for dealers and department stores.

3,500 Attend Opening Of New Showrooms of Experimental Store

MUSKEGON, Mich.—On opening day, 3,500 persons visited the new showrooms of the experimental store operated here by Lou R. Maxon, Inc., advertising agency for General Electric appliances.

A single-page advertisement in the *Muskegon Chronicle* announced the opening, which accounted for sales of five refrigerators, eight electric ranges, four radios, three washers, two water heaters, and approximately 100 small appliances.

Excellent prospects were also obtained, the operators said. The store gave roses as favors to the women.

In addition to operating for profit, the Maxon retail store tests merchandising and advertising ideas for G-E's home appliances. The new store has a "closing" room where electric appliances can be operated and their advantages demonstrated.

Floyd Brown, Frigidaire Senior Service Man, Is Killed by Fall

WICHITA, Kan.—Floyd L. Brown, secretary of the S. A. Long Electric Co., Frigidaire distributor, and in point of years senior service manager in the Frigidaire organization, was killed May 8 in Joplin, Mo., when he slipped and fell, suffering a fractured skull.

Pioneer in the development of the Delco-Light business and its later offshoot, the Frigidaire business, Mr. Brown had been an associate of S. A. Long for 20 years, occupying a position as a member of the firm and serving as district service and installation manager. He was in Joplin to attend a meeting with service and sales personnel when the accident occurred.

His hobby was the service he was able to render as a friend of underprivileged children, and he often stated it was his desire to be able to lend encouragement to some poor lad who needed a boost.

Private Closing Booth Stimulates Sales of Colorado Dealer

COLORADO SPRINGS, Colo. — A private closing booth has stimulated electric refrigerator sales for the Peerless Furniture Co. here.

One side of the company's major appliance department contains three private closing rooms, one of which is devoted to electric refrigeration. In this booth a complete set of electric refrigerators is displayed.

The private display room is used only when the sale is nearing the closing point. Another complete refrigerator display is kept outside in the department proper where all general inquiries are first answered.

"The worth of privacy can hardly be overestimated when it comes to closing deals," says Sam Goloven, partner in the company. "In the private room the prospect is away from the noise, from other merchandise, from distractions of all kinds. Each model in our line is there for her to see and compare with others. Her whole attention is concentrated on refrigerators."

Correction

Headline in last week's issue of the NEWS, "52,280 Units of Norge Products Shipped in April," was incorrect. Norge production for the month was 58,280 units. This was correctly stated in the body of the article.

25,610 Refrigerators Shipped During April By Kelvinator Corp.

DETROIT—Shipments of Kelvinator household electric refrigerators for the month of April came to 25,610 units bringing the total shipments for the seven months fiscal period ending April 30, to 119,667, a 30% increase over the 92,041 units shipped the same period last year, reports V. J. McIntyre, domestic salesmanager.

Shipments of all Kelvinator Corp. refrigeration products for the month of April hit a total of 43,418 units as compared with 39,087 for the same month last year, or an increase of 11%. For the seven months fiscal period ending April 30, all Kelvinator refrigeration product shipments were 192,948 units, a 36% increase over the 51,146 of last year.

Executive Committee Directs Management Of Dry-Kold Corp.

NILES, Mich.—An executive committee consisting of two creditors who are members of the newly-elected board of directors, and one former director who was re-elected, is reorganizing the management and directing the affairs of The Dry-Kold Refrigerator Co., following an audit of the company's books which revealed a reduced cash position, said to have been caused by the alleged embezzlement of funds by a company employ.

Prompt Action Needed

W. F. Harrah, one of the principal stockholders of the company who instigated the audit, called together some of the creditors to inform them of the situation. Because production is at its height during this season of the year, it was felt necessary to devise a plan of procedure at once, so that production might not be interrupted.

Accordingly, a creditor's committee was formulated consisting of five creditors from various districts, and the firm of Warner, Norcorss & Judd, attorneys of Grand Rapids, were retained to draw up a plan, which was presented to the company and accepted by it, and then submitted to the creditors.

The plan has as a basis the placing of a committee of the creditors upon the board of directors, giving them complete control of the management and operation of the business.

Appointed May 12

On May 12 the directors of The Dry-Kold Co. tendered their resignations and a new board was elected consisting of three of the old board members; and H. J. Krackowizer, Refrigeration Appliances, Inc., Chicago; Earl S. Smith, Toledo Porcelain Enamel Products Co., Toledo; F. W. Gampher, Monger Gampher Lumber Co., Elkhart, Ind.; Charles A. Donaldson, Toledo Plate & Window Glass Co., Grand Rapids.

An executive committee consisting of Messrs. Krackowizer, Donaldson, and Harrah was elected to reorganize the management. This committee has announced that a new plant manager is being hired.

For Summer Thirst

Frigidaire's new 'meter-miser' compressor is used in 1936 water-cooler models.

New G-E Distributor Appointed in Miami

MIAMI, Fla.—General Home Appliances, Inc., a new company, has been appointed distributor for General Electric refrigerators and other home appliances in this territory. Jack Webb is president of the organization, and Harry W. Krebbs, Jr., former southern district manager of General Electric Contracts Corp., Atlanta, is vice president.

Headquarters of the firm will be at 28 N. E. Second Ave., and branch offices in Coral Galbes and Miami Beach. A sales division will be maintained in the Mark department store here.

The company had been operating as a division of the store, and the new organization was formed to take advantage of the building boom now under way in the Miami area.

Federal Metal Products Receiver's Report Filed

JERSEY CITY, N. J.—Creditors and stockholders of Federal Metal Products Corp. have been ordered by Chancellor Luther A. Campbell to show cause by 10 a. m. Monday, June 1, 1936, why the report of William Allen Cudlipp, receiver, should not be approved and confirmed and the receiver discharged from any further trust in the premises.

Report of Receiver Cudlipp, filed with the chancellor on May 12, sets forth all amounts of cash received and disbursed, and indicates that no further funds are on hand. The report also lists all general and priority claims filed with the receiver, and indicates which of them were allowed, and which disallowed.

LEADING REFRIGERATOR MANUFACTURERS BUY WINTERS & CRAMPTON HARDWARE

Your manufacturing costs can be kept down to a minimum in styling refrigerator hardware to harmonize with the appearance of your cabinet, if you will consult our staff of engineers as soon as you begin to consider cabinet designs for 1937.

Our Engineering facilities have made it possible for us to cooperate very closely with designers and engineers of the leading manufacturers.

WINTERS & CRAMPTON Engineers are responsible for most of the latest improvements and developments in hardware design and construction. You too can enjoy the advantages which an experienced engineering staff can offer.

It will pay you to contact our organization.

Winters & Crampton Corporation
BOX 231
GRANDVILLE • • • MICHIGAN

NORGE uses SYLPHON BELLOWS in Thermostat Controls

Norge — the refrigerator "that goes 'round and 'round"—provides the same characteristic simplicity and dependability in its thermostat control.

Here, a Sylphon Bellows — the metal diaphragm that has withstood 300 million flexings without noticeable fatigue—is on the job to provide faultless service throughout the life of the refrigerator.

This seamless, jointless, Sylphon metal Bellows, originated and pioneered by Fulton Sylphon Company 35 years ago, has been the subject of more research and development in manufacture and application than any other product of its kind in existence.

Avail yourself of this plus value that costs you nothing—that may pay you well in product acceptance and good will. Ask for Bulletin No. KO-121.

FULTON SYLPHON Co.
KNOXVILLE TENN., U.S.A.

Kelvinator Sales Plans and Promotion on Commercial Refrigeration Aimed to Keep Salesman's Story Consistent

By Phil B. Redeker

DETROIT—Unity and consistency of the presentations which Kelvinator commercial refrigeration salesmen are making to prospects this year are being accomplished through sales educational and sales promotion literature drawn up under the supervision of John Garceau, director of Kelvinator commercial and air-conditioning advertising and sales promotion.

Two main ideas are perceptible in the mass of educational and promotional material which Mr. Garceau has developed for use by the field organization. One is the "more profit" and "exact selection" selling themes which are hammered home in each piece, and the other is the complete way in which the story is told.

Must Tell Whole Story

"We're not satisfied unless every piece of prospect literature that leaves this office tells the story so well that a salesman could do the whole selling job by merely repeating, in his own words, the story that the promotion piece tells.

"Salesmen are advised to tell the same story that is told in line folders, handout pieces, direct mail promotion. If they keep their story in line, the follow-up literature is in the nature of proof, because it tells in print what the prospect has already heard from the salesman."

Asked to Give Same Ideas

This idea is put into words in one of Mr. Garceau's "How to Sell" books on Kelvinator commercial products. He says:

"Possibly the most difficult part of your essential training will be learning to tell virtually the same story (not necessarily in the same words) as that related in the selling literature you will be using.

"Pick up any piece of Kelvinator room cooling literature that has been designed for your use in selling. Read it carefully, page by page.... close the cover.... now, talking aloud, tell the same story the literature tells.... but relate the story in your own words, expanding those points that seem most appealing.

Makes Logical Presentation

"When you have done this, think back over what you have said, and you will find that you made a clear, logical and convincing selling presentation. Practice this art of telling the same story as the literature you use. By doing this, you create a definite impression of authoritative confirmation of your statements.

"The difficulty in learning to do this is not because it requires any great amount of effort or showmanship, but simply because it sounds so simple and easy to do, that you will be prone to regard it as rather elementary... then, too, as you become more and more versed in the subject, you will be inclined to do the entire selling job alone—through the medium of your voice and personality.

"This is a natural human failing which, however, does not justify allowing yourself to get in the habit of ignoring the tremendous assistance your selling literature offers you by indorsing your statements."

Program in Plan Book

Kelvinator's dealer-distributor 1936 commercial refrigeration plan book outlines a 12-point program for "making more profits from Main street."

Step No. 1 covers "how to bring your man-power up to the measure of your market." This is covered more fully elsewhere in this issue.

The next step recommends the appointment of a commercial sales manager if the dealer or distributor has five or more commercial salesmen.

Salesmen Training

Third step explains how salesmen can be trained to do a real selling job on Kelvinator commercial equipment by reading the "How to Sell" booklets supplied by the factory.

In step No. 4 instructions are given on how to equip salesmen to follow Kelvinator' 3-step commercial selling plan.

The fifth step explains the way in which a salesman is to use the Kelvinator 3-step plan, which involves the use of a presentation and proposal file. The three steps in the Kelvinator plan are (1) survey of the need; (2) selection of the equipment; (3) presentation of the proposal.

Advertising for Prospects

Next step tells how to get in touch quickly with prospects, through the medium of advertising in newspapers and local business publications, and through window displays.

"How to win the interest of people who need commercial refrigeration" is told in the seventh step, which describes the commercial direct mail literature and tells briefly how best it my be used.

Steps 8 and 9 tell how to make the first move in the 3-step plan—surveying the need. A recommendation is made that the prospect first be given literature explaining Kelvinator "exact selection" in order that the prospect will look with more favor upon the salesman's request to investigate his refrigeration need. Survey sheets are provided to be filled out for any type of application.

The tenth step involves the matter of the best type of finance plan to offer prospects. A standard commercial sales finance plan, and a commercial meter-ator finance plan are offered.

Use of Data and Survey Sheets

Step 11 explains how the trained refrigeration engineer takes the data and survey sheets, and using them as a basis, specifies the equipment to meet the prospect's need. The engineer's recommendations, together with a price proposal and "sales ammunition" are then assembled in a bound personalized presentation book. The twelfth and final step tells the salesman to use this booklet in closing the sale.

Salesmen for Kelvinator commercial refrigeration dealers and distributors are kept in line with the ideas presented in the dealer plan book through being taught from the "How to Sell Kelvinator Standard Commercial Equipment" booklet prepared by the commercial division sales promotion department.

'Added Profit'

The thought that "added profit" is the one big motive for purchasing commercial refrigeration equipment is pounded home in the opening pages of the booklet, and is elaborated in the last half of the pamphlet.

It is explained to the salesman that he is a real "specialty salesman", the booklet making the definition and distinction as follows:

"Selling may be divided into two classes: merchandising and specialty selling.

"Merchandising may be defined as a sale made to a customer in the place of business of the seller, where the purchaser's selection of equipment is guided by the seller, but final choice rests with the purchaser.

"Specialty selling, on the other hand, is a sales made by a salesman in contact with a customer at the place of the installation of the equipment, where final choice of the equipment rests with the seller, not the purchaser.

Specialty Selling

"Therefore, in the commercial field, you are a specialty salesman. You can't show a prospect some equipment and say: 'Here's a nice selection; which of these do you want?"

Explanation is then made of what the Kelvinator "exact selection" plan on commercial equipment means in terms of selling.

Following this comes a detailed account of how the salesman should employ the 3-step plan to sell commercial refrigeration. Operation of the plan is broken down into the following main divisions.

Using the '3-Step' Plan

Investigation.

A pre-selling survey of the prospect to use as a basis for determining what to sell and how to sell it. Locality and type of store tells the class of trade the merchant serves. Store front, windows, and interiors tell how the prospect operates and suggests the right approach. Salesmen should also find out such facts as: does the prospect own the building, what his business history is, where he lives, what kind of a car he drives, what his hobbies are.

Check Credit Rating.

This is a time saver. Along this line, also find out if a time-payment contract will be accepted, before terms are talked.

Making the Survey

Sheets are provided so that the salesman needs only a 5-ft. rule to make such a survey. The data must be complete for the applications engineer, the salesman is warned.

The Right Approach

Impress the "profit" story on the prospect from the beginning. Get his undivided attention by getting him away from customers and employees. Show him the Presentation Album covering different kinds of commercial applications.

Winning the Prospect's Confidence

Every step the salesman makes should be thoughtfully planned to win the confidence of the merchant in: (1) his ability to be of service to the merchant; (2) product as the best answer to the merchant's needs.

Specification of Equipment

The complete presentation and proposal as made up for the prospect should include the following:

1. Personalized title page.
2. Market pages, selling the need for proper refrigeration in the prospect's own type of business and profits.
3. Testimonial pages.
4. An equipment recommended page, telling not only what is recommended but why.
5. Feature pages, showing why the product is best.
6. Specifications pages, describing the exact equipment recommended.
7. Bill of materials pages, selling the price by providing a complete, itemized list of all the labor and material required for the complete installation.
8. Price proposed page, setting the exact price of the complete installation.
9. Institutional pages, selling the company's name and background.

Closing the Sale

Selling is closing, says the manual, so if the salesman has followed out a thorough logical procedure all the way through he should have no trouble in closing a sale. The profit theme should be emphasized in the closing arguments.

Sales Promotion Literature

Kelvinator's sales promotion literature designed to get the attention of prospects is characterized by a liberal use of illustrations, and a high grade of printing work.

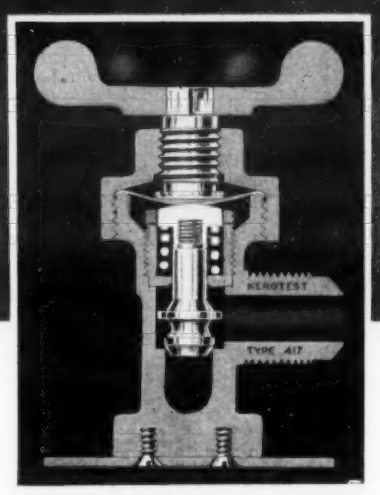
The "profit" and "exact selection" selling themes are emphasized throughout. For example, in the "complete line folder" which tells in general what Kelvinator offers in commercial refrigeration, the copy theme opens with this statement:

"Your refrigeration profits are won or lost on how well your refrigerating equipment is tailored to your individual needs." The copy theme closes with an appeal to "take out 'profit insurance'."

Literature on the various types of commercial refrigeration equipment carry out the same thought, but in a more specific manner.

KEROTEST

LEADERSHIP IN THE WORLD of REFRIGERATION VALVES IS FOUNDED ON SUPERIOR MATERIALS and IMPROVED DESIGN



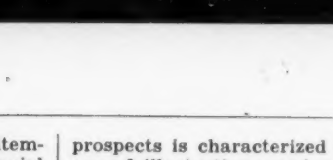
Kerotest Diaphragm Packless Valves are first choice of the refrigeration industry because they combine every advantage a modern valve should possess.

Kerotest made the first commercial shipment of refrigeration valves in 1924 and have remained first in the refrigeration valve industry ever since. They were first to develop the forged valve construction . . . first to design the one and only Diaphragm Packless Valve . . . first to meet every new valve requirement . . . first to build a complete line of accessories including the famous GW Control . . . and first to introduce forged steel valve and manifold construction to meet the modern demands for large refrigerator and air conditioning installations.

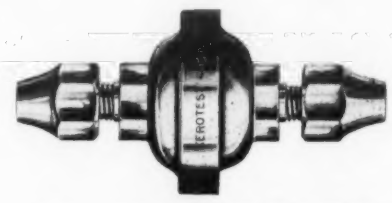
Today, the Kerotest line is replete with every known requirement of the refrigeration industry, and available through a nationwide network of Kerotest jobbers and representatives as listed below.

KEROTEST MANUFACTURING CO.
PITTSBURGH, PA.

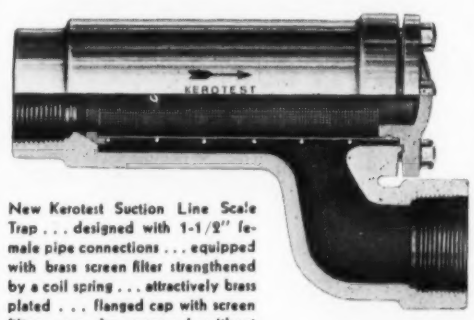
KEROTEST



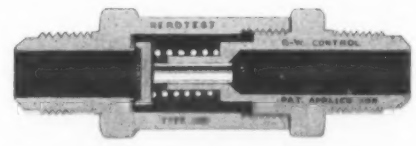
The Kerotest Tellta'e Liquid Indicator is a welcome accessory to the industry—saves much experimenting and testing when the system is not working 100 per cent.



This generously large Forged Brass Strainer provides a very efficient trap for tube scale, compressor chips and other foreign matter which finds its way into the liquid refrigerant or oil.



New Kerotest Suction Line Scale Trap . . . designed with 1-1/2" female pipe connections . . . equipped with brass screen filter strengthened by a coil spring . . . attractively brass plated . . . flanged cap with screen filter may be removed without breaking tubing line . . . does not trap lubricating oil. Can readily be adapted for 1-1/8", 1-3/8", 1-5/8" OD copper tubing.



Kerotest GW Control represents one of the greatest developments in modern refrigeration . . . assuring perfect regulation of refrigerant without interrupting proper return flow of the oil.

Jobbers with Local Stocks

Albany, N. Y.....Hoy & Co.
Atlanta, Ga...J. M. Tull Metal & Supply Co., Inc.
Baltimore, Md.....Clendenin Bros., Inc.
Baltimore, Md...Melchior, Armstrong, Dessau Co.
Boston, Mass.....A. E. Borden Co.
Bridgeport, Conn.....Parsons Bros.
Brooklyn, N. Y.
Coleman Electrical Supply Co., Inc.
Buffalo, N. Y.....Root, Neal & Co.
Cambridge, Mass...Melchior, Armstrong, Dessau Co.
Chicago, Ill.....H. W. Blythe Co.
Chicago, Ill.....Max A. R. Matthews
Chicago, Ill.....Borg-Warner Service Parts Co.
Chicago, Ill...Refrigeration Equip. & Supply Co.
Chicago, Ill.....Fred C. Kramer Co.
Cincinnati, Ohio.....The Merkel Bros. Co.
Cincinnati, Ohio.....Williams & Co., Inc.
Cleveland, Ohio.....Williams & Co., Inc.
Columbus, Ohio.....The Justus & Parker Co.
Dallas, Texas.....The Electromotive Co.
Davenport, Iowa.....Republic Electric Co.
Denver, Colo.....Auto Equipment Co.
Des Moines, Iowa.....C. L. Percival Co.
Detroit, Mich.....J. M. Obere, Inc.
El Paso, Texas.....Zork Hardware Co.
Fargo, N. D.....Fargo Foundry Co.
Fernwood, Miss.....Enochs Sales Co.
Fort Wayne, Ind.....H. J. Schroeder Co.
Greensboro, N. C....Home Appliance Service Co.
Harrisburg, Pa...Melchior, Armstrong, Dessau Co.
Honolulu, T. H.....Theo. H. Davies & Co., Ltd.
Houston, Texas.....D. C. Lingo Co.
Houston, Texas..Walter Refrigeration Supply Co.
Indianapolis, Ind.....F. H. Langsenkamp Co.
Kansas City, Mo...Forslund Pump & Machinery Co.
Long Beach, Calif.....L. B. Marsh
Los Angeles, Calif....Refrigeration Service, Inc.
Macon, Ga.....Lowe Electric Co.
Memphis, Tenn...United Refrigerator Supply Co.
Milwaukee, Wis...Chase Brass & Copper Co., Inc.
Minneapolis, Minn.
Chase Brass & Copper Co., Inc.
Minneapolis, Minn.
Refrigeration & Industrial Supply Co., Inc.
Montreal, Quebec, Canada
Railway & Engineering Specialties, Ltd.
Newark, N. J.....McIntire Connector Co.
New Orleans, La.....Enochs Sales Co.
New York, N. Y.....Aetna Supply Co.
New York, N. Y.
Melchior, Armstrong, Dessau Co., Inc.
New York, N. Y..Paramount Electrical Supply Co.
Oklahoma City, Okla.....Mideke Supply Co.
Omaha, Nebraska.....United Supply Co.
Peoria, Ill.....Isaac Walker Hardware Co.
Pittsburgh, Pa.....Williams & Co., Inc.
Philadelphia, Pa.
Melchior, Armstrong, Dessau Co., Inc.
Providence, R. I.
Rhode Island Supply & Engineering Co.
Puerto Rico, San Juan..Refrigeration Supply Co.
Rochester, N. Y.....Ontario Metal Supply, Inc.
San Francisco, Calif...California Refrigerator Co.
St. Joseph, Mo.....Bristol Supply Co.
St. Louis, Mo.....The Spangler Co.
Salt Lake City, Utah.....Peerless Utah Co.
San Antonio, Tex.....Straus-Frank Co.
Sacramento, Calif.....J. N. Blair Co.
San Francisco, Calif.
Refrigerating & Power Specialties Co.
San Juan, Puerto Rico..Refrigeration Supply Co.
Sioux City, Iowa..National Refrigeration Service
Springfield, Ill.....United States Electric Co.
Springfield, Mass.....C. P. Payson Co.
Syracuse, N. Y.....Syracuse Supply Co.
Toronto, Ont., Canada
Railway & Engineering Specialties Co.
Tulsa, Okla.....Machine Tool & Supply Co.
Vancouver, B. C., Canada.....Fleck Bros., Ltd.
Waterloo, Iowa.....Winterbottom Supply Co.
White Plains, N. Y.
County Seat Plumbing Supply Co., Inc.
Wilkes Barre, Pa.....Radio Service Co.
Winnipeg, Manitoba, Canada
Railway & Engineering Specialties Co.

Factory Representatives

Chicago, Ill.....G. C. Taylor
Dallas, Texas.....C. E. Boren
Dayton, Ohio.....E. J. Kimm
Denver, Colo.....R. L. Chambers
Detroit, Mich.....T. F. Wilson
Los Angeles, Calif.....Van D. Clothier
New York, N. Y.....K. M. Newcum
San Francisco, Calif...A. W. V. Johnson
Omaha, Nebr.....Austin Jones

Australia Representatives

F. C. Lovelock, Ltd.
235 Clarence St.
Sydney, Australia

General Export Representatives

Melchior, Armstrong, Dessau Co.
300 Fourth Ave.
New York City, N. Y., U.S.A.

AIR CONDITIONING EQUIPMENT SPECIFICATIONS

Specifications of air-conditioning equipment are published on this and succeeding left-hand pages through page 18 of this issue.

Manufacturers were asked to supply data by four different classes of equipment (it was required that all equipment have a cooling function): (1) Self-contained floor-type air conditioning cabinets, with compressor installed in the base by the manufacturer; (2) Remote floor-type air-conditioning cabinets, for remote installation of compressor; (3) Suspended-type air conditioners for wall or ceiling, for remote installation of compressor; (4) Duct-type air-conditioning units, from which conditioned air is distributed through ducts.

For self-contained conditioners, data is given on the compressor and condensing unit while refrigeration capacity with cold water is given in place of the compressor data on other types. There are a few exceptions to this and these are shown by the heads over the data columns.

Capacities for the various functions are given on the basis of rating methods approved last year by trade associations and engineering societies.

Cooling capacity of the units, unless otherwise specified, is given in B.t.u.'s per hour with entering air at 80° F. dry bulb and 50% relative humidity, and with a saturated refrigerant temperature of 40° F. at the outlet of the evaporator for direct expansion systems; and an entering water temperature of 40° F., with 10° rise for cold water systems.

Heating capacity is given in B.t.u.'s per hour with a 2-lb. steam supply, and the entering air at 70° F. (dry bulb).

Capacity of the humidifier is given in pounds of water per hour, with entering air at 70° F. and 30% relative humidity.

Where manufacturers use some other set of conditions for rating their units, such exceptions are noted with an asterisk (*), dagger (†), or some such marking.

Prices given are list f.o.b. factory unless otherwise specified.

Blower capacity is given in cubic feet per minute, and the air velocity through the outlet grille is in feet per minute.

Power input is given in terms of watthours. It should be noted that the power inputs for the condensing unit, and for the blower, are given individually.

Index to the specifications is as follows:

American Blower 10
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Kelvinator

Kelvinator Corp., Detroit, Mich.

Functions — Self-contained type: models SC34-DM and SC50-DM—cooling, dehumidifying, and cleaning; SCA-50, SCA-85—heating, cooling, dehumidifying, cleaning; all other self-contained—heating, cooling humidifying, dehumidifying, cleaning. Remote-floor type: model FT55-DU—cooling, dehumidifying, cleaning; all other remote-floor type — heating, cooling, humidifying, dehumidifying, cleaning. Suspended type: all models—cooling, dehumidifying, cleaning. Suspended or duct type and duct type: all models—heating, cooling, humidifying, dehumidifying, cleaning.

Cabinet—Self-contained and remote-floor type: Kelvinator steel cabinet with walnut finish. Suspended type: Kelvinator steel frame with Masonite panels. Flat gray finish. Duct type: Kelvinator steel cabinet with flat gray finish. All insulated.

Compressor—Self-contained: Kelvinator two-cylinder water-cooled compressor except models SCA-50 and SCA-85, air cooled. Overload and fused disconnect switch and high side safety cut-out on all models. Model SC160-DU also has across-the-line starter. Manual disconnect compressor control on SC34-DM, SC50-DM, and SCA-50. All others have pressure compressor control.

Blower—Self-contained, remote floor type, and small suspended units: centrifugal blower with direct-connected capacitor motor. Large suspended units: centrifugal blower V-belt-driven by repulsion-induction motor. Duct type: centrifugal blower V-belt-driven by squirrel-cage motor.

Air Circulation—Self-contained and remote floor types: models SC34-DM, SC50-DM, and SCA-50—air intake in one end. All others—both ends. All discharge through top. Fresh air intake on models SCA-50 and SCA-85. Suspended type: air intake in top, discharge in front. Fresh air intake optional. Duct type: air intake in top or side, discharge in top. Fresh air intake optional.

Cooling System — Self-contained type: direct expansion only. All other types: direct expansion or circulating cold water except model FT55-DU (direct expansion only). Copper cooling coils.

Heating System—Copper coils. Heating capacity—models FT80-DU and FT50-DC, 6,000; FT110-DU and FT75-DC, 12,000; FT160-DU and FT100-DC, 16,000; CA-6354, 120,000; CA-8354, 146,000; CA-6551, 185,000; CA-8551, 216,000.

Type of Humidifier—Spray.

Air Cleaning Medium—Owens-Illinois filter.

Controls—Self-contained type: all models—float valve; models SC80-DU through SC100-DC—thermostat and air by-pass damper; models SC80-DU through SC50-DM — water-regulating valve; models SC80-DU through SC100-DC and SCA-85—liquid line solenoid valve; models SC50-DC, SC75-DC, and SC100-DC—humidistat and by-pass damper motor. Remote floor type: all models—thermostatic expansion valve, air by-pass damper, and refrigerant superheater; models FT50-DC, FT75-DC, and FT100-DC—by-pass damper motor. Suspended type: all models—thermostatic expansion valve and refrigerant superheater. Suspended or duct type and duct type: all models—thermostatic expansion valve, air by-pass damper, and refrigerant superheater.

Self-Contained Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrigeration Capacity Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Refrigerant Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	WEIGHT Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	BLOWER Speed R.p.m.	BLOWER Diam. In.	BLOWER Total C.f.m.	BLOWER Veloc. F.p.m.	BLOWER Input Watts
SC-80-DU	.....	93.4	25.5	2,900	6,800	9,700	Freon	6¼	1 11/16 x 2	575	¾	960	9,300	2.5	630	750	53⅛ x 34¼ x 19¼	1/10	1,140	(2) 5	275	600	60
SC-110-DU	.....	132.0	41.0	4,200	10,000	14,200	Freon	11¾	2¼ x 2½	375	1	1,330	19,400	2.9	750	975	55⅜ x 42¾ x 19¼	1/20	1,140	(2) 5⅜	390	600	90
SC-160-DU	.....	166.0	41.0	5,400	12,800	18,200	Freon	14¼	2¼ x 2½	490	1½	1,600	24,000	4.0	875	1,020	58⅛ x 42¾ x 19¼	1/10	1,140	(2) 6	535	730	120
SC-50-DC	.....	93.4	25.5	1,400	5,700	7,100	Freon	6¼	1½ x 1¾	575	½	660	9,300	2.5	630	725	53⅛ x 34¼ x 19¼	1/10	1,140	(2) 5	275	600	60
SC-75-DC	.....	132.0	41.0	1,700	8,300	10,000	Freon	9⅞	1 13/16 x 2½	375	¾	945	19,400	2.9	700	970	55⅜ x 42¾ x 19¼	1/20	1,140	(2) 5⅜	390	600	90
SC-100-DC	.....	166.0	41.0	3,700	11,400	15,100	Freon	14¼	2¼ x 2½	375	1	1,160	24,000	4.0	850	985	58⅛ x 42¾ x 19¼	1/10	1,140	(2) 6	535	730	120
SC-34-DM	.....	21.2	0.	1,350	2,650	4,000	Freon	2¼	1¼ x 1½	640	⅛	410	0	0.	325	450	27⅝ x 34¼ x 16	1/40	810	5⅜	150	410	57
SC-50-DM	.....	31.4	0.	2,150	4,250	6,400	Freon	2½	1½ x 1¾	575	½	640	0	0.	360	490	31⅞ x 34¼ x 16	1/40	805	6	225	615	62
SCA-50	.....	39.2	17.7	1,100	4,750	5,850	Freon	...	1½ x 1¾	575	½	700	12,000	0.	575	630	42⅛ x 48⅛ x 19	1/10	960	6	195	550	113
SCA-85	.....	86.8	40.2	2,600	7,200	9,800	Freon	...	1 13/16 x 2½	450	1	1,500	24,000	0.	740	960	45⅛ x 51½ x 22	1/20	960	(2) 5⅜	390	630	52

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	DIRECT EXPANSION Refrigeration Capacity Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Refrigerant Charge Lbs.	WATER Refrigeration Capacity Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	WEIGHT Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	BLOWER Speed R.p.m.	BLOWER Diam. In.	BLOWER Total C.f.m.	BLOWER Veloc. F.p.m.	BLOWER Input Watts
FT-55-DU	$.....	62.3	0	2,600	5,000	7,600	...	...	....	....	....	...	...	0	185	285	27⅝ x 34¼ x 14½	1/10	960	(2) 5	240	520	39
FT-80-DU	.....	93.4	25.5	3,900	6,900	10,800	...	...	510	5,490	6,000	1.20	0.10	2.5	230	335	31⅞ x 34¼ x 14½	1/40	1,140	(2) 5	275	600	60
FT-110-DU	.....	132.0	41	5,300	9,700	15,000	...	...	2,940	9,060	12,000	2.40	0.30	2.9	290	405	31⅞ x 42¾ x 14½	1/20	1,140	(2) 5⅜	390	600	90
FT-160-DU	.....	166.0	41	6,900	13,000	19,900	...	...	3,920	12,080	16,000	3.20	0.40	4.0	330	450	34⅝ x 42⅞ x 17	1/10	1,140	(2) 6	535	730	120
FT-50-DC	.....	93.4	25.5	3,900	6,900	10,800	...	...	510	5,490	6,000	1.20	0.10	2.5	235	340	31⅞ x 34¼ x 14½	1/40	1,140	(2) 5	275	600	60
FT-75-DC	.....	132.0	41	5,300	9,700	15,000	...	...	2,940	9,060	12,000	2.40	0.30	2.9	295	410	31⅞ x 42¾ x 14½	1/20	1,140	(2) 5⅜	390	600	90
FT-100-DC	.....	166.0	41	6,900	13,000	19,900	...	...	3,920	12,080	16,000	3.20	0.40	4.0	335	455	34⅝ x 42¾ x 17	1/10	1,140	(2) 6	535	730	120
Suspended Type																							
C-70-DU	$.....	70.4	0	3,200	6,600	9,800	...	...	600	5,400	6,000	1.2	0.1	0	175	250	15⅝ x 30⅝ x 17⅜	1/40	1,140	5	265	630	62
C-125-DU	.....	125.0	0	5,600	10,300	15,900	...	...	1,825	9,175	11,000	2.2	0.3	0	215	325	19⅝ x 31⅛ x 22	1/20	1,140	5⅜	378	860	70
C-200-DU	.....	220.0	0	9,900	18,100	28,000	...	...	7,560	16,440	24,000	4.8	2.2	0	375	450	19⅝ x 46¼ x 22	1/10	1,120	6	663	753	120
C-375-DU	.....	441.0	0	18,900	34,600	53,500	...	...	15,120	32,880	48,000	9.6	1.9	0	450	685	22⅝ x 46¼ x 33	¼	940	8⅛	1,260	860	285
Suspended or Duct Type																							
CA-6354	$.....	372	260	17,000	34,600	51,600	...	...	13,930	34,070	48,000	9.6	1.0	15.0	590	925	28 x 46¼ x 53¾	½	635	9¾	1,400	935	215
CA-8354	.....	495	260	24,800	46,200	71,000	...	...	20,300	44,200	64,500	12.9	2.7	18.5	620	975	28 x 46¼ x 53¾	½	825	9¾	1,770	1,180	350
CA-6551	.....	580	350	33,000	61,000	94,000	...	...	21,400	53,600	75,000	15.0	1.3	23.0	820	1,200	32 x 50¼ x 65⅜	½	520	11⅜	2,200	975	280
CA-8551	.....	770	350	38,600	71,400	110,000	...	...	31,500	68,500	100,000	20.0	2.7	29.0	835	1,250	32 x 50¼ x 65⅜	½	660	11⅜	2,760	1,225	470
Duct Type																							
CS-610	$.....	765	Variable	40,000	85,000	125,000	...	...	40,300	87,700	128,000	25.6	4.35	Var.	...	...	42¼ x 60 x 81	†	†	(2) 13	4,000	...	†
CS-810	.....	800	Variable	40,000	75,000	115,000	...	...	36,100	74,900	111,000	22.0	7.20	Var.	...	...	42¼ x 60 x 81	†	†	(2) 13	4,000	...	†
CS-615	.....	1,175	Variable	61,500	129,500	191,000	...	...	42,800	107,200	150,000	30.0	1.30	Var.	...	...	68 x 53 x 128	†	†	19½‡	6,000	...	†
CS-815	.....	1,250	Variable	62,000	116,000	178,000	...	...	44,300	105,700	150,000	30.0	2.10	Var.	...	...	68 x 53 x 116	†	†	19½‡	5,000	...	†
CS-620	.....	1,735	Variable	91,000	191,000	282,000	...	...	64,100	160,900	225,000	45.0	1.30	Var.	...	...	68 x 82 x 128	†	†	(2) 22¾	9,000	...	†
CS-820	.....	1,570	Variable	78,500	145,500	224,000	...	...	63,000	137,000	200,000	40.0	2.70	Var.	...	...	68 x 53 x 128	†	†	19½‡	6,000	...	†
CS-630	.....	2,290	Variable	120,000	252,000	372,000	...	...	121,000	263,000	384,000	76.8	4.35	Var.	...	...	76 x 82 x 142	†	†	(2) 19½‡	14,000	...	†
CS-830	.....	2,310	Variable	115,000	215,000	330,000	...	...	94,500	205,500	300,000	60.0	2.70	Var.	...	...	68 x 82 x 128	†	†	(2) 22¾	9,000	...	†
CS-840	.....	3,220	Variable	161,000	299,000	460,000	...	...	144,000	300,000	444,000	88.4	7.20	Var.	...	...	76 x 82 x 142	†	†	(2) 22¾	14,000	...	†

*60° water used. †Determined by duct resistance ‡Blower either 19½ or 22¾.

Fedders

Fedders Mfg. Co., Inc.
Buffalo, N. Y.

Functions—Cooling and dehumidifying.

Cabinet—Suspended type: Fedders brass cabinet, electro-tin plated, not insulated.

Blower—Self-contained type: Schwitzer-Cummins propeller-type blower, G-E and Westinghouse motors, direct connected.

Air Circulation—Suspended type: air intake in rear, discharge in front, no fresh air intake. Fedders adjustable discharge grille.

Cooling System—Fedders copper cooling coils.

Suspended Type

Model No.	Price†	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Refrigerant Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	WEIGHT Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	BLOWER Speed R.p.m.	BLOWER Diam. In.	BLOWER Total C.f.m.	BLOWER Veloc. F.p.m.	BLOWER Input Watts
212	$114.00	47	0	....	....	....	SO_2 or	...	.....	...	...	...	...	0	44	68	14 x 15¾ x 15¾	1/30	1,150	12	786	714	65
216	139.00	83	0	....	....	....	CH_3Cl	...	.....	...	...	...	...	0	77	113	19¼ x 19⅜ x 18⅞	1/20	850	16	1,228	607	90
316	149.00	125	0	....	....	....	or Freon	...	.....	...	...	...	...	0	86	126	19¼ x 19⅜ x 20⅜	1/20	850	16	1,190	588	90
318	218.00	215	0	....	....	....		...	.....	...	...	...	...	0	162	234	24⅜ x 23⅝ x 26¼	1/13	860	18	1,852	658	116
Duct Type																							
15-V	$.....	30.4	0	....	....	....	SO_2 or	...	.....	...	...	...	...	0	31.8	...	9⅛ x 15⅛ x 8⅞	...	...	..	...	...	...
35-V	.....	105.3	0	....	....	....	CH_3Cl or	...	.....	...	...	...	...	0	91.6	...	18⅛ x 22 x 10⅛	...	...	..	...	...	...
301-V	.....	441.0	0	....	....	....	Freon	...	.....	...	...	...	...	0	275.0	...	67¼ x 85⅛ x 8½	...	...	..	...	...	...
753-V	.....	1,633.0	0	....	....	....		...	.....	...	...	...	...	0	1,063.0	...	75¼ x 102⅜ x 8¼	...	...	..	...	...	...
1005-V	.....	2,730.0	0	....	....	....		...	.....	...	...	...	...	0	1,635.0	...	80 x 85¾ x 16½	...	...	..	...	...	...

†Price includes thermostatic expansion valve, hanger brackets, and 60-cycle, 110-volt, single-phase, constant-speed motor.

Air Conditioning

Special Condenser Design Features Servel's New Big Machines for Air Conditioning

(Concluded from Page 1, Column 2)

Servel machines, but affords a lower resistance to water and refrigerant flow than is possible with the former design.

In detail, the condenser comprises two banks of three slender shell-and-tube sections arranged and inter-connected to obtain true counter-flow of refrigerant and cooling water. The cold water enters the tubes at one end of the first shell of the series, meeting the condensed liquid, and sub-cooling it, passes through the second shell, the third shell, and finally through the heads on the compressor cylinders where it picks up the super-heat at comparatively high temperature.

Arranged thus, it will be seen that each pair of cylinders has its own condenser series, and it is claimed that the counter-flow arrangement insures maximum heat transfer at low net temperature differential.

The refrigerant leaving the shell passes into a separate steel receiver to insure against flooding the condenser surface with excess refrigerant and consequent loss of heat transfer surface.

The high efficiency of this condenser design makes it economical for use with city water where the water rates are moderate, but the condenser is equally suitable for spray tower installations, as it has a very low resistance in the water circuit, the Servel engineers claim.

Servel tests indicate that seven to ten pounds net head will usually be ample to offset the frictional losses in the entire assembly, even when using comparatively warm water.

The Vee-type construction using two suction valves and two liquid valves was selected by Servel engineers to simplify the adaptation of these machines to varying load applications. By the use of two valves (either manual or electric) one pair of cylinders may be by-passed to reduce the capacity 50% when it is necessary to cut a portion of the evaporators out of the circuit.

Leading Detroit Heating Contractors Prefer to 'Farm Out' Refrigeration Operations

DETROIT—Heating and sheet metal contractors on the whole have not found it worth while to add refrigeration departments to their organizations to facilitate air-conditioning installation work, was the general impression gained from interviews with several of the oldest Detroit firms recently.

Arnold N. Brodie, of J. Brodie and Son, Inc., ventilation contractors, a 20-year-old firm, says that although his company was one of the first in Detroit to enter the air-conditioning field, ventilating is still its principal business.

This firm, which had the contract for one of the first air conditioning installations in the city, the Fox Theater, makes a practice of "farming out" its refrigeration installation jobs to independent service men throughout the city. Any of a number of service men are contacted, and the one with the right price gets the job, is the way Mr. Brodie describes it.

In small jobs, of course, he said, where a centralization of responsibility is necessary, the contract should not be split, but in big jobs the only logical procedure, in his opinion, is to divide the contracts.

Brodie's buys its equipment from various sources, either according to the stipulation of the buyer, or according to the need. Fans, for example, are bought from any one of the large companies, such as American Blower, Buffalo Forge, and Sturtevant.

In many cases, he said, the customer will purchase his own equipment. For the Ford exposition building in Texas, which is one of the jobs that the company is working on now, Ford has bought his own refrigeration equipment from Carrier and that company will do its own installing, according to Mr. Brodie.

Similarly for the Oldsmobile engineering and display building to be completed some time this fall or winter, the automobile firm is purchasing its own equipment, although Brodie's has the ventilation contract.

At the Detroit Sheet Metal Works, C. F. Turner, purchasing agent, said that although that company had contemplated going into complete air conditioning, opinions seem lately to be against it, because there are "so many in the game." It was his opinion that air conditioning was being tossed around between too many widely divergent types of companies.

At present, Mr. Turner said, the Detroit Sheet Metal Works does only purely industrial jobs, usually consisting of humidification or filtration necessary to protect an industrial process.

"If we did go into the cooling angle of air conditioning," he said, "we would probably have to sub-let that part of the contract, because at present most of us in this business don't know anything about refrigeration."

Representatives of Domestic Air Conditioning Co., heating engineers, another old firm, said that they have no connection at all with refrigeration. This company does duct work and the engineering for installations.

All contracts coming to Domestic Air Conditioning Co. are sub-let to it, usually by the company which has the order for the furnace, so that its representatives have no direct connection with the contractor at all.

Until this year, all its connections came through Gar Wood, but at present other contracts are being received from General Electric, Chrysler, Kelvinator, Delco, and Seasonair.

Venderbush Co., also sheet metal contractors, has been in the air conditioning business five of the company's 36 business years, according to Ray Venderbush.

Although the majority of this company's air conditioning contracts call for cooling by well water, provision is also made for electric refrigeration, Mr. Venderbush says. He buys the refrigeration equipment himself, and some of the 30 or 35 men in his installation department do the installing. However, he says, he sublets the contracts for all of the electrical work to such firms as Van-Norman, electrical contractor.

R. L. Spitzley Heating Co. is one heating concern of long standing that has gone into all angles of air conditioning extensively since its entrance into the field three years ago.

It has its own individual departments for service, installation, electrical contracting, sheet metal, steam fitting, and plumbing.

As state distributor for Delco-Frigidaire, this company has dealers throughout the state, and in Detroit does both the wholesale and retail work directly.

The company has sold 350 tons of refrigeration so far this year, more than was sold all of last year, reports C. H. Lewis, sales manager of the air conditioning department. Two of the jobs the company has recently completed in Detroit are Fyfe's Shoe Store, and Pack-Wolin's.

Few other contractors have gone into the business extensively, Mr. Lewis believes, because the capital outlay is so great. In other cities, however, the percentage of entrants into the air conditioning field from the heating business is much higher than in Detroit, he said.

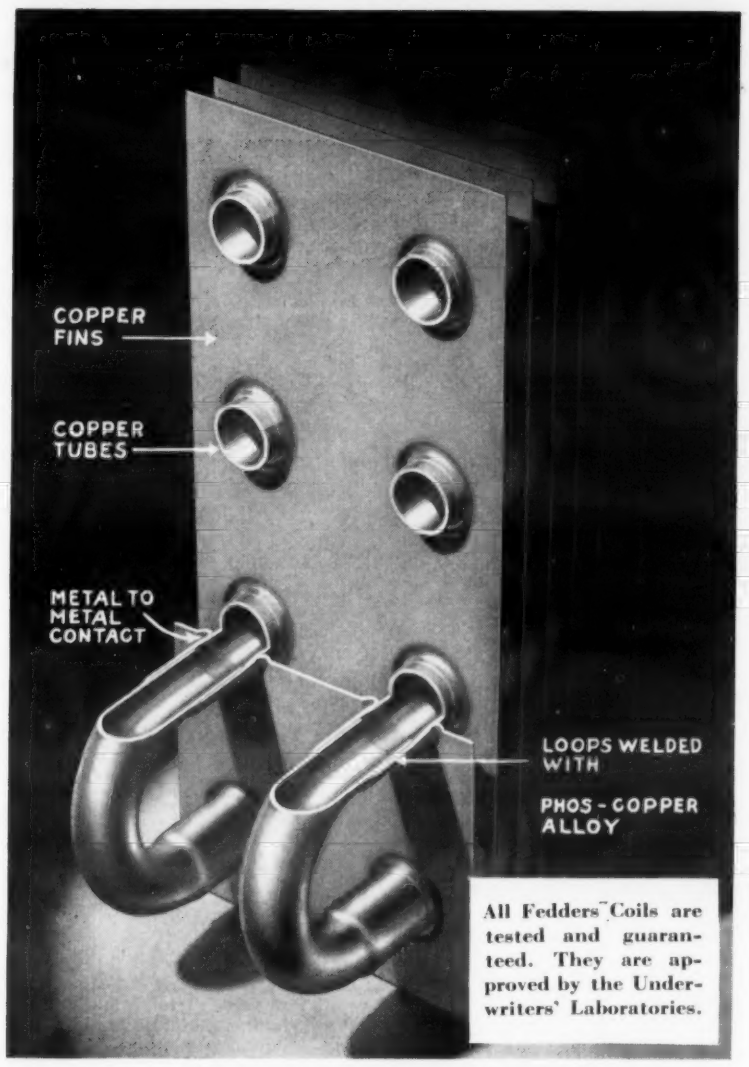
Sports Leaders Attend Announcement Banquet Of Spitzley Co.

DETROIT—Delco-Frigidaire honored the head of its state distributorship, R. L. Spitzley, of R. L. Spitzley Heating Co., at an announcement banquet at the Detroit Yacht Club May 14. About 140 attended.

Although the announcement of the appointment of the heating company as state distributor under the new General Motors subsidiary, Delco-Frigidaire, was made some time ago, this direct announcement was for architects and builders, reports C. H. Lewis, air-conditioning sales manager.

At the speakers' table were: C. E. Lewis, chief engineer of Delco-Frigidaire; Malcolm Bingay, of the *Detroit Free Press;* Tod Rockwell, sports writer; Elliott Shumaker, of the *Free Press;* Joe Cronin, manager of the Boston Red Sox; Jimmie Foxx, also of the Red Sox; Hank Greenberg and Pete Fox, both of the Detroit Tigers; Jack Adams, manager of the Detroit Red Wings, Stanley Cup hockey champions; Harry Kipke, football coach of the University of Michigan; Gus Dorais, University of Detroit football coach, and Potsy Clark, coach of Detroit Lions, professional football champions.

The PERFORMANCE You Get Out of FEDDERS COILS and VALVES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COPPER TUBES
METAL TO METAL CONTACT
LOOPS WELDED WITH
PHOS-COPPER ALLOY
All Fedders Coils are tested and guaranteed. They are approved by the Underwriters' Laboratories.

Cutaway section of Fed-R-Fin Coil showing Copper Fins in Metal-to-Metal Contact with Copper Tubes. Note how loops are telescoped into tubes and WELDED with Phos-Copper Welding Alloy.

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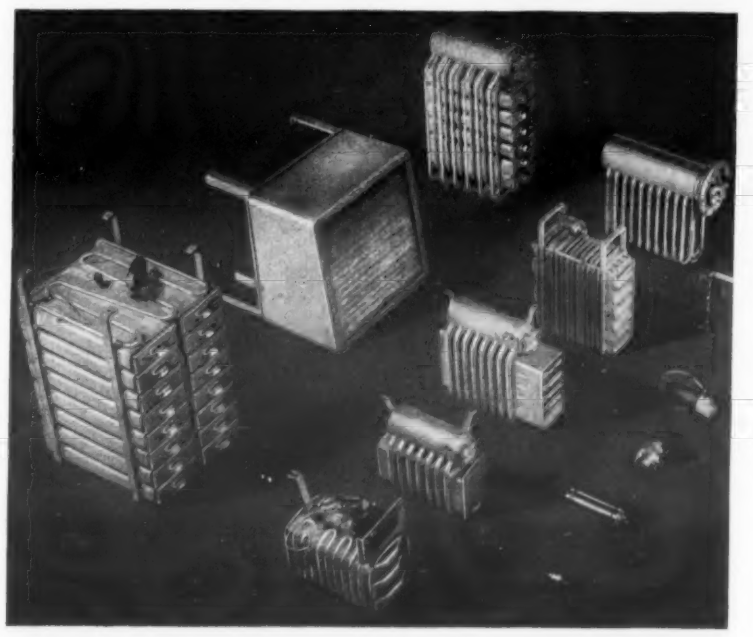

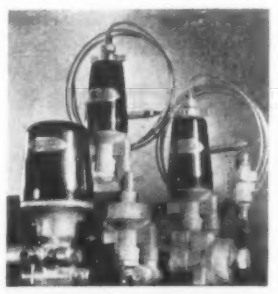

Model 33 Thermostatic Automatic Expansion, Constant Pressure, Two-Temperature, and Check Valves

VALVES

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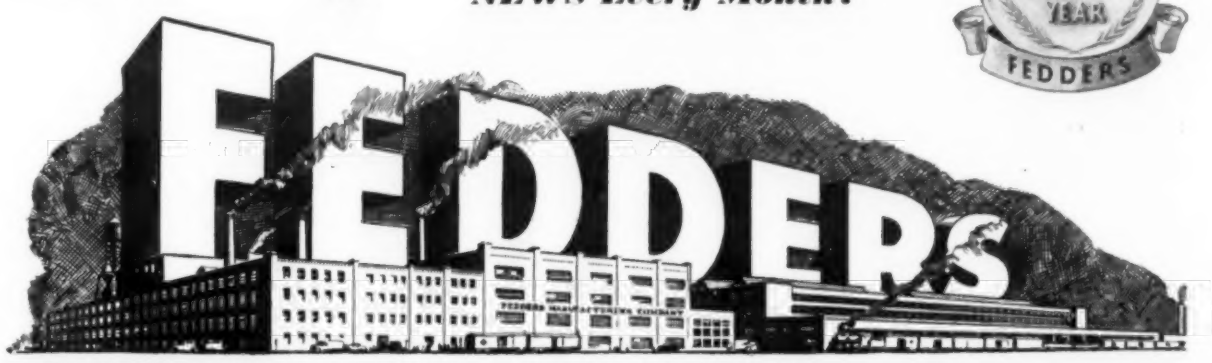

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General Electric

General Electric Co.
Air Conditioning Dept.
Bloomfield, N. J.

Functions — Self-contained type: model FC-1, cooling and dehumidifying; FC-2, cooling, dehumidifying, and cleaning; FR-1, heating, cooling, humidifying, dehumidifying, and cleaning. Remote floor type: models AG-1 and AG-2, cooling and dehumidifying; AD-3 and AD-4, heating, cooling, humidifying, dehumidifying, and cleaning. Suspended type: models AG-4 and AG-10, cooling and dehumidifying; AG-12, AG-14, and AG-15, cooling, dehumidifying, and cleaning. Duct type: heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet—Self-contained type: models FC-1 and FR-1, insulated steel cabinet, walnut finish. FC-2 insulated wood cabinet, walnut veneer finish. Remote floor type: not insulated, cold-rolled sheet steel cabinets, walnut finish. Suspended and duct types: not insulated, cold-rolled sheet steel cabinet, walnut two-tone gray finish.

Compressor — Self-contained type: models FC-1 and FR-1, G-E two-cylinder water-cooled compressor; model FC-2, G-E single-cylinder air-cooled compressor. G-E single-phase repulsion-induction motor. G-E magnetic across-the-line starter. High side safety cut-out. Head pressure cut-out, and suction pressure control.

Blower—Self-contained type: FC-1, G-E aphonic pressure propeller type; FC-2 and FR-1, two centrifugal fans. G-E motors, type KH on model FC-2. Direct drive. Remote floor type: models AD-3 and AD-4, centrifugal type. Direct-drive G-E capacitor motor; models AG-1 and AG-2, G-E aphonic pressure propeller. G-E resistance split-phase motors, direct drive. Suspended type: models AG-4 and AG-10, centrifugal type. G-E capacitor motor, direct drive; models AG-12, AG-14, and AG-15, G-E aphonic pressure propeller. G-E resistance phase motor, direct drive. Duct type: G-E centrifugal multiblade blower, G-E motors, belt drive.

Air Circulation—Self-contained type: air intake in side; discharge in top on FC-1 and FC-2, in front on FR-1. Fresh air intake provided on models FC-2 and FR-1. G-E grille on FC-1, G-E louvres on FC-2, G-E adjustable louvres on FR-1. Remote floor type: air intake in side, discharge in front. Fresh air intake on AD-3 and AD-4. G-E adjustable louvres on AD-3 and AD-4; non-adjustable grille on AG-1 and AG-2. Suspended type: air intake in side on AG-4 and AG-10, rear on AG-12, AG-14, and AG-15; discharge in front. No fresh air intake. Non-adjustable grille. Duct type: air intake in rear, discharge on three sides at top in model AA-3, on two sides at top in AA-4, in front end on H models. Fresh air intake provided on all models.

Cooling System—Self-contained type: direct expansion. Remote floor type and suspended type: direct expansion, circulating cold water optional. Duct type: direct expansion on AA-3 and AA-4, direct expansion or circulating cold water on H models. G-E copper cooling coils on all models.

Heating System—G-E copper coils can be used with hot water. Heating capacities, model FR-1, 11,500 B.t.u.; AD-3 11,500; AD-4, 21,000; AA-3, 130,000; AA-4, 260,000; HC-1, 41,000 to 153,000; HC-2, 41,000 to 244,000; HC-3, 41,000 to 397,000; HC-4, 41,000 to 641,000; and HD-1, 70,000 to 80,000.

Type of Humidifier—Self-contained and remote floor types: open pan. Duct type: screen drip.

Air Cleaning Medium — Viscous coated glass wool filter.

Controls—Self-contained type: thermostatic expansion valve; water regulating valve on FC-1 and FR-1. Remote floor and suspended types: thermostatic expansion valve. Duct type: thermostatic expansion valve; humidistat on AA-3 and AA-4.

Self-Contained

Model	No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
FC-1	.....	400.00	29.8	0	1,850†	2,800†	4,650†	Freon	3½	2 x 1½	400	½	800‡	0	0	500	625	37¼ x 40½ x 13⅞	1/60	1,400	7	200	...	¶
FC-2	.....	435.00	...	0	1,450†	4,150†	5,500†	Freon	(3) ¼	1¼ x .86	1,725	(3) ⅛	1,240‡	0	0	600	725	47 x 49¾ x 19¾	1/6	1,725	6	275	...	¶
FR-1	.....	550.00	46.0	...	3,200†	5,100†	8,350†	Freon	5½	2 x 2½	390	1	1,300‡	11,500	1.8	523	650	39¼ x 63 x 14⅜	1/60	820	6	200	...	¶

†Capacity of model FC-1, figured at 32° refrigerant temperature, model FC-2, 42°, and model FR-1, 28° F. refrigerant balance point. ‡Total including blowers. ¶See compressor for total for unit.

Remote Floor Type

Model	No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
AD-3	...	$295.00	46.0	15.0	1,820	3,830	5,650	Freon†	...	2,850	4,750	7,600	...	...	1.8	175	225	39¼ x 36⅝ x 14⅜	1/60	820	6	200	...	100
AD-4	....	385.00	78.0	29.2	3,560	8,360	11,920	Freon†	...	5,200	9,800	15,000	...	...	3.0	275	325	39¼ x 50⅝ x 14⅜	1/30	820	6	450	...	100
AG-1	.....	175.00	40.0	0	....	....	5,880	Freon†	...	2,500	5,500	8,000	...	...	0	81	111	31½ x 31 x 17½	1/100	800	10	475	...	...
AG-2	.....	200.00	80.0	0	3,630	8,130	11,760	Freon†	...	5,700	10,200	15,900	...	...	0	98	128	31½ x 31 x 17½	1/100	800	10	475	...	38

*City water temperature. †Freon used for ratings.

Suspended Type

AG-4	.....	$195.00	80.0	0	3,630	8,130	11,760	Freon	...	5,700	10,200	15,900	...	...	...	100	130	24⅛ x 29½ x 16⅞	1/100	800	10	475	...	38
AG-10	....	215.00	85.0	0	4,180	9,320	13,500	Freon	...	6,700	11,300	18,000	...	...	...	120	145	23⅝ x 28⅞ x 16⅞	⅛	1,140	10	650	...	120
AG-12	....	330.00	156.0	0	8,000	15,000	23,000	Freon	...	...	...	...	...	...	...	360	400	26 x 43⅛ x 29⅛	⅛	1,140	14	1,000	...	170
AG-14	....	330.00	...	0	9,320	16,680	26,000	Freon	...	...	...	...	...	...	...	250	300	22 x 38 x 24	1/10	1,140	14	1,000	...	170
AG-15	....	410.00	234	0	13,300	28,000	41,300	Freon	...	...	...	...	...	...	...	450	500	37⅛ x 43⅛ x 29⅛	⅛	1,140	19½	2,200	...	220

Duct Type

AA-3	.....	$ 620.00†	...	185	11,300	24,500	35,800	F-12	...	....	....	....	...	...	12.5	495	606	81¾ x 28⅞ x 32¾	⅛	1,725	12¼	1,600	...	195
AA-4	.....	1,155.00†	...	370	22,600	49,000	71,600	F-12	...	....	....	....	...	...	25.0	990	1,220	81¾ x 54⅜ x 32¾	¼	1,725	12¼	3,200	...	370
HC-1	.....	‡	...	...	....	....	26,200 to 92,300	F-12	...	....	....	....	...	...	20	400	450	25⅛ x 43⅛ x ¶	**	...	**	1,200 to 2,400	**	...
HC-2	.....	‡	...	...	....	....	39,700 to 138,500	F-12	...	....	....	....	...	...	58	to	to	37⅛ x 43⅛ x ¶	**	...	**	1,800 to 3,600	**	...
HC-3	.....	‡	...	...	....	....	65,200 to 197,000	F-12	...	....	....	....	...	...	78	3,600	4,000	57⅛ x 43⅛ x ¶	**	...	**	3,000 to 6,000	**	...
HC-4	.....	‡	...	...	....	....	105,000 to 315,000	F-12	...	....	....	....	...	...	116			87⅛ x 43⅛ x ¶	**	...	**	4,800 to 9,600	**	...
HD-1	.....	‡	...	...	....	....	19,200	F-12	...	....	....	....	...	...	3.0	500	600	18⅞ x 42⅞ x 54¾	⅛ to ¼	825 to 890	9	850 to 1,000	...	...

*Water at tap temperature. †Prices quoted are for the year-'round unit. ‡Prices vary with size and type of installation. ** Blowers on HC models use motors varying from ¼ to 8 hp., diameter from 12 to 36 in., and have a velocity at grille of 300 to 600 f.p.m. ¶Depth varies from 29⅛" to 113⅛" depending upon functions included.

Delco-Frigidaire

Delco Frigidaire Conditioning Corp.
Dayton, Ohio.

Functions — Self-contained type: models SC-38 and SC-75, cooling and dehumidifying; SC-40, SC-80, SC-301, and SCV-66, cooling, dehumidifying, and cleaning; SCVH-66, heating, cooling, humidifying, dehumidifying, and cleaning. Remote floor type: R50 and R100, cooling and dehumidifying; RH50, and RH100, heating, cooling, humidifying, dehumidifying; cleaning supplied on remote floor type units as extra equipment. Suspended type: SUH300, heating, cooling, dehumidifying, and cleaning; SF-150 and SU-300, cooling, dehumidifying, and cleaning; SUD300, cooling, re-heating, dehumidifying, and cleaning; all others, cooling and dehumidifying, with cleaning available.

Cabinet—Self-contained type: insulated steel cabinet, brown wrinkle finish on SC301; buff lacquer on SCV66 and SCVH66; walnut lacquer on all others. Remote floor type: insulated steel cabinet with butt-grained walnut finish. Suspended type: steel and hard-fiber cabinets on C models, with brown hard-pressed fiber finish; steel cabinets with brown wrinkle finish on S models; not insulated.

Compressor—Frigidaire two-cylinder water-cooled compressor. Delco motor, manual motor starter. High side safety valve.

Blower—Self-contained type: Frigidaire disc cone type blower on models SC38 and SC40, twin centrifugal type on all others. Delco motors, direct connected. Remote floor type: Delco Frigidaire blower. Delco motor, direct connected. Suspended type: Delco-Frigidaire cone-type fan blower on models C-50V, C-50H, C-100V, and C-100H; Delco-Frigidaire disc blower on SF-150; Delco-Frigidaire multiblade centrifugal on SU-300, SUH-300, and SUD-300; Delco motor, direct connected.

Air Circulation—Self-contained type: air intake in back on models SC-38, SC-40, SC-75, and SC-80; in front on SC-301; front grille and outside intake on SCH-66 and SCVH-66. Air discharge in top. Fresh air intake provided on models SC-40, SC-80, SCH-66, and SCVH-66. Frigidaire octagonal grilles. Remote floor type: air intake in rear, discharge in top, fresh air intake provided. Delco-Frigidaire discharge grille. Suspended type: air intake in rear, discharge in front. No fresh air intake. Delco-Frigidaire discharge grille.

Cooling System—Self-contained type: direct expansion. Remote floor type: direct expansion and circulating cold water. Suspended type: direct expansion.

Heating System—Delco-Frigidaire copper heating coils, can be used with hot water. Heating capacities: model SCH-66, 10,800 B.t.u.; RH-50, 9,600; RH-100, 18,000; SUH-300, 38,400.

Type of Humidifier—Self-contained type: spray. Remote floor type: nozzle.

Air Cleaning Medium—Filter.

Controls—Self-contained type: thermostat on models SC-40, SC-80, SC-301, SCH-66, and SCVH-66; liquid line solenoid valves on SC-75, SCH-66, and SCVH-66; water regulating valve. Remote floor type: thermostatic expansion valve, thermostat, and liquid line solenoid valve. Suspended type: thermostatic expansion valve; liquid line solenoid valve (extra equipment on SF-150, SV-300, SUH-300, SUD-300); thermostat available as extra equipment.

Self-Contained

Model	No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT‡ Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
SC-38	.....	$.....	....	0	1,010	3,490	4,500	Freon	6	2½ x 3½	590	½	560	0	0	360	452	42⅜ x 26⅜ x 19⅜	1/100	1,120	....	300	...	45
SC-40	.....	.....	....	0	950	3,320	4,270	Freon	6	2½ x 3½	590	½	560	0	0	400	455	42⅞ x 26¾ x 19¾	1/100	1,120	....	290	...	45
SC-75	.....	.....	....	0	2,740	4,900	7,640	Freon	8	2½ x 3½	590	1	1,145	0	0	450	615	42⅜ x 29½ x 23⅜	1/30	800	....	300	...	80
SC-80	.....	.....	....	0	3,200	4,290	7,490	Freon	8	2½ x 3½	590	¾	860	0	0	550	606	42⅞ x 28½ x 23¾	1/30	800	....	325	...	80
SC-301	....	.....	....	0	9,600	24,800	34,400	Freon	19	2½ x 3½	590	3	3,180	0	0	1,300	1,750	143 x 51¾ x 31¾	⅛	830	....	1,200	...	..
SCV-66	...	.....	....	0	5,040	2,960	8,000	Freon	6	2½ x 3½	590	1	1,000	0	0	600	828	30⅜ x 62 x 20⅛	1/30	800	....	400	...	80
SCVH-66	...	.....	....	....	5,040	2,960	8,000	Freon	6	2½ x 3½	590	1	1,000	†10,800	3¼	640	828	30⅜ x 62 x 20⅛	..	...	....	400	...	80

†Rated with 1-lb. steam supply. ‡80° inlet condensing water used.

Remote Floor Type

Model	No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
R-50	.....	$.....	....	0	1,650	5,050	6,700	Freon	2	.....	...	...	...	...	0	120	175	26¾ x 26½ x 17⅛	1/100	...	....	300	...	..
RH-50	....	.....	....	....	1,650	5,050	6,700	Freon	2	.....	...	...	...	...	..	130	185	26¾ x 26½ x 17⅛	1/100	...	....	300	...	..
R-100	.....	.....	....	0	3,100	9,000	12,100	Freon	4	.....	...	...	...	...	0	195	277	30 x 36½ x 17⅛	1/16	...	....	475	...	..
RH-100	...	.....	....	....	3,100	9,000	12,100	Freon	4	.....	...	...	...	...	..	205	287	30 x 36½ x 17⅛	1/16	...	....	400	...	..

Suspended Type

C-50V	....	$.....	....	0	....	5,050	6,700	Freon	2	....	....	....	....	....	0	95	120	22⅞ x 23⅛ x 14¼	..	...	....	300	...	..
C-50H	....	.....	....	0	....	5,050	6,700	Freon	2	....	....	....	....	....	0	95	120	16¾ x 17½ x 19	..	...	....	300	...	..
C-100V	...	.....	....	0	....	8,600	11,400	Freon	4	....	....	....	....	....	0	120	160	25⅞ x 33⅛ x 14¼	..	...	....	400	...	..
C-100H	...	.....	....	0	....	8,600	11,400	Freon	4	....	....	....	....	....	0	120	160	18¼ x 22¾ x 20¼	..	...	....	400	...	..
SF-150	...	.....	....	0	....	11,000	16,900	Freon	5	....	....	....	....	....	0	139	175	18¼ x 23 x 24¾	1/20	...	....	525	...	..
SU-300	...	.....	....	0	....	24,900	34,200	Freon	10	....	....	....	....	....	0	298	547	16¼ x 51¾ x 42⅜	⅛	...	....	1,350	...	..
SUH-300		.....	....	...	....	24,900	34,200	Freon	10	....	....	....	....	....	0	365	587	16¼ x 51¾ x 47⅝	⅛	...	....	1,350	...	..
SUD-300		.....	....	0	....	24,900	34,200	Freon	10	....	....	....	....	....	0	398	650	16¼ x 51¾ x 47⅝	⅛	...	....	1,350	...	..

Baker

Baker Ice Machine Co., Inc.
Omaha, Nebr.

Functions — Cooling, dehumidifying, and cleaning, with humidifying optional.

Cabinet—Baker steel cabinet, lacquer finish, not insulated.

Compressor — Baker water-cooled compressor, two cylinders on models 2,000, 3,000, and 4,000; four cylinders on models 5,000 and 6,000; eight cylinders on models 7,000, 8,000, and 9,000. High side safety cutout. Pressure or thermostat type control.

Cooling System—Type optional.

Control — Thermostatic expansion valve and float valve optional; thermostat, liquid line solenoid valve, and water-regulating valve standard; humidistat extra; air by-pass dampers special.

Remote Floor, Suspended or Duct Type

Model	No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
†2000	....	.....	...	0	....	....	....	Freon	...	3¾ x 3½	...	3	...	0	...	...	1,700	91 x 58 x 30	...	...	..	...	...	...
†3000	....	.....	...	0	....	....	....	or	...	3¾ x 3½	...	5	...	0	...	...	2,000	91 x 58 x 30	...	...	..	...	...	...
†4000	....	.....	...	0	....	....	....	CH_3Cl	...	3¾ x 3½	...	7½	...	0	...	...	2,300	91 x 58 x 32	...	...	..	...	...	...
†5000	....	.....	...	0	....	....	....		...	3¾ x 3½	...	10	...	0	...	...	2,700	91 x 84 x 30	...	...	..	...	...	...
†6000	....	.....	...	0	....	....	....		...	3¾ x 3½	...	15	...	0	...	...	3,100	91 x 84 x 34	...	...	..	...	...	...
‡7000	....	.....	...	0	....	....	....		...	3¾ x 3½	...	20	...	0	...	...	3,500	111 x 82 x 42	...	...	..	...	...	...
‡8000	....	.....	...	0	....	....	....		...	3¾ x 3½	...	25	...	0	...	...	3,900	111 x 82 x 45	...	...	..	...	...	...
‡9000	....	.....	...	0	....	....	....		...	3¾ x 3½	...	30	...	0	...	...	4,300	111 x 120 x 42	...	...	..	...	...	...

†Remote floor-type models designated by FT, suspended by C, duct type by FS. ‡Remote models designated by FT, duct type by FS.

Honey Farm's Need Of Dehumidification Met by Conditioning

JARVIS, Ont.—Air conditioning has proved a "sweet" investment for the Hodgson Apiaries here.

Through improvement of quality, the company received a return of more than 100% on the money it spent in air conditioning its honey storage rooms last year. As a result, the company has decided to double its original installation.

Main job, in honey storage, is one of dehumidification, since honey has a great affinity for water. This the Cully Electric, Hamilton, Ont., contractor, was not long in discovering, according to Manager J. W. Ramsden of the firm.

Humidity Lowered 36%

At first, a temperature too low for satisfaction was obtained, with the result that the honey containers sweated badly and became soggy.

Then the temperature was raised and the equipment was operated manually, allowing the condensing unit to run for several hours, collecting a heavy frost on a blower type coil. The unit was then stopped, and the coil quickly defrosted.

This method lowered humidity to 36%, and provided satisfactory operation. Automatic controls to maintain this condition were then installed, and the equipment operated without manual control thereafter.

Original storage room was 18 feet wide, 15 feet deep, and 12 feet high, located in the basement of the building, and insulated with 2 inches of cork and earth banked on three sides.

Brings Higher Prices

Last year's crop of honey, 90,000 lbs., was disposed of immediately at top prices, 1½ cents per lb. more than many competitors, some of whom still have considerable honey on hand.

Samples of honey, taken by the company, showed that proper conditioning played an important part in maintaining the product at highest quality and texture.

First sample, of honey put immediately in storage, had a very fine texture, similar in appearance to lard; second sample, put in storage two weeks after processing, had a texture similar to fine granulated sugar; texture of the third sample, not put in storage, was quite coarse.

Six Air-Conditioning Jobs Are Being Installed In Birmingham

BIRMINGHAM—Plans are going ahead for the six air conditioning jobs recently sold here, and for the installations which are being considered for the new state highway building and city hall in Montgomery.

In Mobile, a restaurant, drug store, and the dining room of a hotel have recently air conditioned.

Sales of Cabinet-Type Conditioners Show Gain in March

(*Concluded from Page 1, Column 5*)

a nice gain for the month, jumping to $123,861 from a February total of $76,582.

Industrial systems of the central-station type, low in February, made a notable increase during March, the $95,970 in orders being almost three times the $35,477 reported for the month previous. Central-station type systems for human comfort showed a rise of almost $150,000 in March orders, total for this class of equipment being $717,498 against $569,122 in February.

Orders for refrigeration equipment for air-conditioning systems went to $124,017 from a February total of $103,282. Included in this class are systems sold to contractors or other distributing outlets who are not manufacturers of air-conditioning equipment.

Air washer orders during March totaled $71,673, and air filter orders $43,701, compared with February figures of $39,746 and $15,213, respectively.

Orders in the fan group during March amounted to $1,055,930, compared to a February volume of $783,573, and a January volume of $648,931.

A decrease in orders in the unit heater group was reported for the month, orders dropping to $562,036, from a February total of $716,082.

A complete tabulation of air-conditioning orders for March and the first quarter of 1936 will be found on this page.

Denverite Proposes to Condition 'Outdoors' Of Whole Cities

DENVER—Joseph A. Shires is a man who is really trying to do something about the weather—in a big way.

Eternal spring for the city dweller by means of "outdoor" air conditioning is what Mr. Shires has in mind, although he has a lot of proving to do before he convinces the various city officials to whom he has presented his ideas.

His plan involves the fencing off of all sidewalks with pipes. These would be connected to a central system, pumping cooling brine through the pipes in summer, and steam through them in the winter. This, he believes, would cool the air in the summer, and warm it in the winter.

Expense of such a system, Mr. Shires admits, would be terrific, but his idea is that the benefits of such wholesale air conditioning would more than offset the cost of installation and maintenance.

One thing that could be removed from the weather-controlled city's budget, though, Mr. Shires believes, is the expense of snow removal. He figures that the snow would melt before it fell.

Conditioning Orders for March Total $3,477,752; Increase of 33.2% Over February Bookings

Data tabulated below is the third in a series of monthly statistics on the value of orders booked for air-conditioning systems and equipment, released through the office of Director William L. Austin, Bureau of the Census, Department of Commerce. Orders booked by 98 manufacturers are shown in this tabulation.

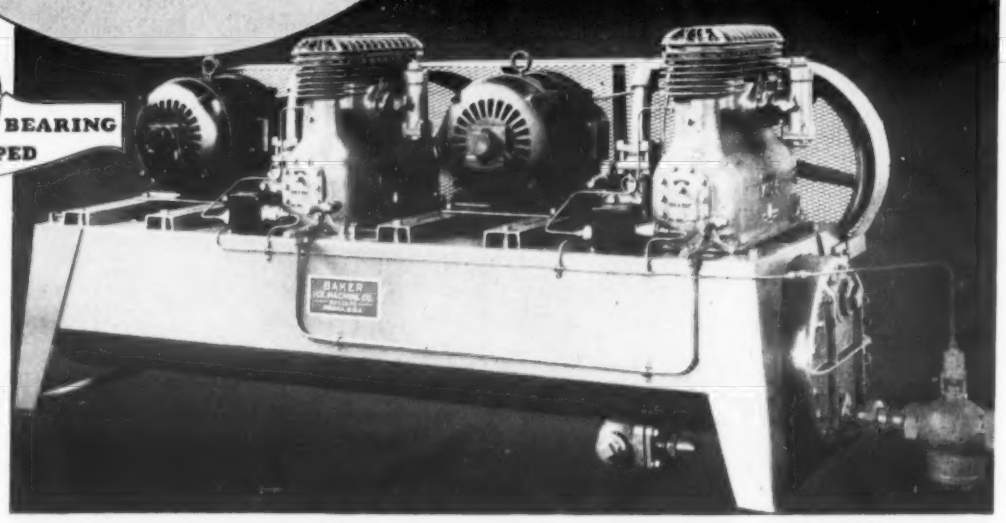
Item	Value of Orders Booked For 1936 March	February	Total, First 3 Months of 1936
Total	**$3,477,752**	**$2,611,241**	**$8,402,527**
(A) Air Conditioning Group—Total	**$1,859,786**	**$1,111,586**	**$3,922,330**
Unit Systems—			
Self-contained (shipped substantially complete)	123,841	76,582	236,706
Not self-contained (shipped in sections), including refrigerating or cooling medium	639,665	192,763	1,047,848
Central-station Systems, excluding installation if installed—			
Human comfort (including refrigerating or cooling medium sold separately or otherwise for air conditioning)*	717,498	569,122	1,594,561
Industrial (including refrigerating or cooling medium sold separately or otherwise for air conditioning)*	95,970	35,477	210,153
Refrigerating or cooling medium sold to contractors or other distributing outlets (not manufacturing air-conditioning equipment) for air-conditioning systems, when such knowledge as to the application is available	124,017	103,282	399,744
Air washers, including pumps and motors and control where furnished	71,673	39,746	150,776
Air filters (not including sales of filters used with machinery other than fans)—			
Continuous type	4,991	139	6,057
Unit type	38,710	15,074	70,491
Humidifiers	43,401	79,401	205,994
(B) Fan Group—Total	**$1,055,930**	**$ 783,573**	**$2,488,434**
Fans, including bearings, pulleys, or couplings (if furnished)—			
For public and semi-public buildings	178,453	105,753	372,514
For general industrial uses	355,066	229,724	808,491
For mechanical draft	156,132	124,434	359,124
For jobber stocks and unknown uses	49,067	54,201	121,607
Small housed and propeller fans—			
Direct connected small housed blowers with motors and control (merchandise motors)	67,638	65,687	238,033
Propeller fans, direct connected and belted (for ventilation only)	169,410	136,360	383,129
Driving mechanism for general fan use (not reported above)—			
Electric motors and controllers (manufactured or jobbed)	69,849	55,926	174,335
Steam engines (manufactured or jobbed)	3,289	9,785	16,651
Steam turbines (manufactured or jobbed)	7,026	1,703	14,550
(C) Unit Heater Group—Total	**$ 562,036**	**$ 716,082**	**$1,991,763**
Industrial Type Unit Heaters, including heating element and motors where furnished—			
Equipped with blower-type (centrifugal) fans	78,396	120,122	281,328
Equipped with propeller-type fans	184,644	247,075	751,000
School-Room Type Unit Heaters, including heating element and motors and control where furnished	130,570	216,401	549,474
Indirect Heating Surface (not including unit heater surface)—			
Steel pipe coil type (manufactured or jobbed)	1,291	6,039	9,803
Cast iron type (manufactured or jobber)	28,399	9,217	48,792
Copper or aluminum type (manufactured or jobbed)	138,736	117,228	351,366

*Includes incidental equipment, such as temperature, motor, humidity, and electrical controls, dampers, outlets, etc. as are sold with each.

DESIGNED BY BAKER especially for Air Conditioning

44 MODELS FOR FREON OR METHYL-CHLORIDE FROM ¾ to 60 H.P.

TIMKEN BEARING EQUIPPED



GENERAL LINE SPECIFICATIONS

One-piece, semi-steel casting of cylinders and crankcase assuring accurate alignment for life of unit.

Precision honed cylinders.

Drop forged steel crankshaft with extra large bearing surfaces, precision machined and accurately balanced.

Timken tapered roller bearings on thrust and blind ends of crankshaft.

Full force feed lubrication on all large size units. Small units use splash and spray type oiling system.

Drop-forged steel connecting rods with babbitt bearings and large area wrist pin bushings.

Double trunk type pistons fitted with high quality compression and oil wiping rings.

Shell & Tube type extra capacity condensers with removable head for easy cleaning when clogged with sediment and scale from mineral deposits in water.

Quiet, high capacity, positive seating discharge and suction valves.

Write for detailed specifications on any unit.

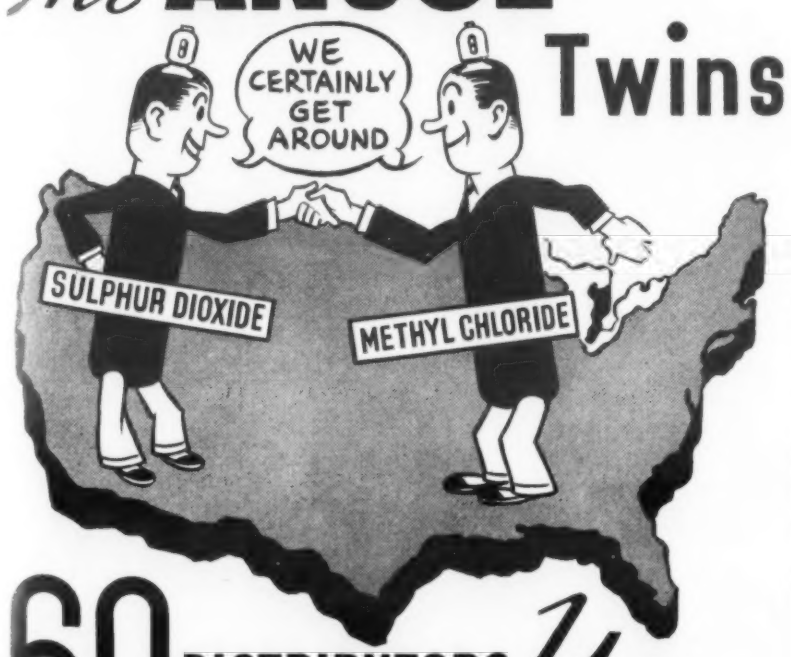
performance proved by increasing demand for these units

Baker has designed a complete line of Freon Units especially for air conditioning service. It includes forty-four different models, graduated in capacities from ¾ H.P. two cylinder type to 60 H.P. dual-mounted four cylinder units. Efficiency and performance of these precision-built machines is proven by pressing demand from all parts of the country. Baker factories are operating on 24 hour shifts to supply dealers and distributors with units. Inquiries from interested dealers invited —full factory co-operation in sales and engineering assured.

BAKER
ICE MACHINE CO., INC.
Factories: Los Angeles, Seattle, Ft. Worth, Omaha. Central Sales: Chicago. Eastern Sales: New York. Other sales and service offices in principal cities.

This emblem identifies the manufacturer who is best prepared to give you prompt, reliable factory cooperation on all air conditioning jobs.

The ANSUL Twins



60 DISTRIBUTORS TO SERVE You

No matter where you are located there is an Ansul warehouse nearby carrying complete stocks of Ansul *analyzed* Sulphur Dioxide and Methyl Chloride. Write today for the location of the nearest distributor.

ANSUL CHEMICAL COMPANY
MARINETTE » » » » » WISCONSIN

Servel

Servel, Inc.
Commercial Refrigeration Division
Evansville, Ind.

Functions — Self-contained type: cooling, dehumidifying, and cleaning. Remote floor type: heating, cooling, dehumidifying, and cleaning. Suspended type: cooling and dehumidifying. Duct type: heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet—Self-contained and remote floor types: Servel steel cabinet, walnut finish standard. Suspended and duct types: Servel steel cabinet with green lacquer finish. Self-contained and suspended cabinets are insulated.

Compressor—Self-contained: Servel two-cylinder, water-cooled compressor. Wagner motor with manual push-button disconnect motor overload protection. High side safety cutout. Pressure control.

Blower—Self-contained, remote floor type, and duct type: double-centrifugal blower with direct-connected Wagner motor. Suspended type: propeller blade type blower with direct-connected Wagner motor.

Air Circulation—Self-contained and remote floor types: air intake in top, air discharge in top, fresh air intake optional. Suspended and duct types: air intake in rear, air discharge in front.

Cooling System—All types: direct expansion only. Servel copper cooling coils.

Heating System—Servel copper coils. Heating capacity: model ACO-301, 125,000 B.t.u.

Type of Humidifying—Spray nozzle.

Air Cleaning Medium—American and Owens-Illinois filter.

Controls—Thermostatic expansion valve on all models; water-regulating valve on model ACFU-101.

Special Features — All models: header coil, inserted expansion valve bulb, heat exchanger; model AC-101, variable-pitched fan blades.

Self-Contained Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
ACFU-101	$.....	164.94	0	....	....	12,300	Freon	6	2⅛ x 2	465	1	1,270	0	0	557	650	31 x 67½ x 15¾	1/60	1,140	(2) 6	600	...	130

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
ACFD-101	$.....	164.94	76.55	...	...	12,300	Freon	...	....	....	....	...	....	0	222	310	31¼ x 43 x 13¼	1/60	1,140	(2) 6	600	...	130

Suspended Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
AC-101	$.....	160.0	0	....	....	12,200	Freon	...	....	....	....	...	....	0	146	201	22½ x 22½ x 20	1/15	1,140	...	1,650†	...	140

†Adjustable, 1,650 is maximum.

Duct Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
ACO-301	$.....	437.14	192.72	....	....	42,000	Freon	...	....	....	....	....	...	2	441†	495†	18 x 50½ x 37½‡	½	1,140	8 x 10	2,700	...	600

*Temperature of water used: Tap. †With heating attachment, 640 lbs. net; 755 gross. ‡With heating attachment, width is 55⅝ in.

Westinghouse

Westinghouse Electric & Mfg. Co.
Springfield, Mass.

Functions — Self-contained type: cooling and dehumidifying. Remote floor type: models EL-10, EL-14, EH-10, and EH-14, cooling, dehumidifying, and cleaning; EL-12, EL-15, EH-12, and EH-15, heating, cooling, humidifying, dehumidifying, and cleaning. Suspended type: cooling and dehumidifying.

Cabinet—Self-contained and remote floor types: Westinghouse steel cabinet, not insulated, walnut or mahogany finish. Suspended type: Westinghouse steel cabinet, partly insulated, walnut, mahogany, or gray finish.

Compressor—Self-contained type: Westinghouse four-cylinder, hermetic compressor, water cooled. Westinghouse capacitor motor. Westinghouse sequential motor starter. High side safety cut-out. Manual control (thermostat as an accessory).

Blower — Westinghouse propeller blower. Westinghouse capacitor motor, direct drive.

Air Circulation—Self-contained and remote floor types: air intake in ends, discharge in top. Fresh air intake provided as accessory. Westinghouse bar-type discharge grilles. Suspended type: air intake in top, bottom, and sides, discharge in top. No fresh air intake. Westinghouse discharge grilles.

Cooling System — Self-contained type: direct expansion. Remote floor type: models EL-10, EL-12, EH-10, and EH-12, direct expansion; models EL-14, EL-15, EH-14, and EH-15, circulating cold water. Suspended type: models ES-05 and ES-10, direct expansion: ES-054 and ES-14, circulating cold water. Young copper cooling coils.

Heating System—Bush copper heating coils, can be used with hot water. Heating capacities: models EL-12, EL-15, EH-12, and EH-15, 23,350 B.t.u.

Type of Humidifier—Impact.

Air Cleaning Medium — Westinghouse copper mesh filter.

Controls—Self-contained type: thermostatic expansion valve and water-regulating valve. Remote floor type: thermostatic expansion valve on EL-10, EL-12, EH-10, and EH-12. Suspended type: thermostatic expansion valve on ES-05 and ES-10.

Self-Contained

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
SW-05 ...	$380.00	60.8	0	4,700	2 300	7,000	F-12	3½	1 x ⅞	1,725	(2) ¼	890	0	0	345	470	26⅝ x 38¾ x 13½	1/75	910	10¼	225	400	30

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
EL-10 ...	$150.00	130	0	2,820	8,805	11,625	F-12	...	....	....	....	...	....	0	180	305	26⅝ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	400	400	50
EL-12 ...	180.00	130	35.4	2,820	8,805	11,625	F-12	...	....	....	....	...	....	30	200	325	26⅝ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	400	400	50
EL-14 ...	150.00	130	0	...	...	...	Water	...	3,360	9,670	13,030	2.4	2.5	0	170	295	26⅝ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	425	425	50
EL-15 ...	180.00	130	35.4	...	...	...	Water	...	3,360	9,670	13,030	2.4	2.5	30	210	335	26⅝ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	425	425	50
EH-10 ...	150.00	130	0	2,820	8,805	11,625	F-12	...	....	....	....	...	....	0	215	350	39¾ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	400	400	50
EH-12 ...	180.00	130	35.4	2,820	8,805	11,625	F-12	...	....	....	....	...	....	30	255	390	39¾ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	400	400	50
EH-14 ...	.....	130	0	...	...	...	Water	...	3,360	9,670	13,030	2.4	2.5	0	205	340	39¾ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	425	425	50
EH-15 ...	.....	130	35.4	...	...	...	Water	...	3,360	9,670	13,030	2.4	2.5	30	245	380	39¾ x 38 1/16 x 13 7/16	1/150	800	(2) 10¼	425	425	50

Suspended Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
ES-05	$ 95.00	64	0	1,400	4,325	5,725	Freon	...	....	....	....	...	....	0	90	165	16¼ x 18⅜ x 13⅜	1/150	725	10¼	225	350	25
ES-054 ...	95.00	64	0	....	....	....	Water	...	1,680	4,835	6,515	1.2	1.25	0	85	160	16¼ x 18⅜ x 13⅜	1/150	725	10¼	225	350	25
ES-10	125.00	112	0	2,800	8,650	11,450	Freon	...	....	....	....	...	....	0	130	220	21⅜ x 23¾ x 14	1/75	860	12	485	350	30
ES-14	125.00	112	0	....	....	....	Water	...	3,360	9,670	13,030	2.4	2.5	0	120	210	21⅜ x 23¾ x 14	1/75	860	12	485	350	30

*50° water used.

Fairbanks-Morse

Fairbanks-Morse & Co.
Chicago, Ill.

Functions — Self-contained type: cooling, dehumidifying, and cleaning. Remote floor type: heating, cooling, humidifying, dehumidifying, and cleaning. Suspended type: cooling, dehumidifying, and cleaning. Duct type: heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet — Self-contained, remote floor, and suspended types: F-M insulated steel cabinet, finish optional grained or pastel. Duct type: F-M insulated steel cabinets, aluminum finish.

Blower—Self-contained and remote floor types: F-M centrifugal blower. F-M motor. Direct drive. Suspended type: model 715, aphonic type blower, F-M motor, direct drive; models 736 and 824, F-M centrifugal blower, F-M motor, direct drive. Duct type: F-M centrifugal blower. F-M motor. V-belt drive.

Air Circulation—Self-contained type: air intake in side, discharge in top. Fresh air intake provided. Uni-flo discharge grille. Remote floor type: air intake in back, discharge in top. Fresh air intake and Uni-flo discharge grille on 612 and 624. F-M discharge grille on 4420. Suspended type: air intake in back on 715 and 736, front on 824; discharge in front. No fresh air intake. Uni-flo discharge grille.

Cooling System — Self-contained type: direct expansion. All other models: direct expansion and circulating cold water. Copper cooling coils on all but model 4420, which are cast.

Heating System—Copper cooling coils on all but 4420, cast. Coils may be used with hot water. Heating capacities—model 612, 16,000; 624, 27,700; 760, 133,000; H-1000, 295,000; H-2000, 445,000; V-1000, 295,000; V-2000, 445,000.

Air Cleaning Medium—Dustop filter.

Self-Contained Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
6100	$.....	...	0	....	....	....	Freon	...	....	....	....	...	0	0	...	...	.....	...	...	...	...	...	...

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
612	$427.50	...	...	4,750	7,250	12,000	Freon	...	3 500	6,500	10,000	...	...	...	...	...	25¼ x 38 x 14½	...	1,060	(2) 4½	400	300	80
624	650.00	...	...	11,250	17,750	29,000	or	...	10,000	17,500	27,500	...	...	...	...	...	30⅜ x 41 x 20	...	750	(2) 9	900	400	...
4420	.....	...	...	....	....	....	Water	...	....	....	....	...	...	...	...	...	.....	...	...	(2) ..	...	...	...

Suspended Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
715	$550.00	...	...	6,840	11,160	18,000	F-12	...	....	....	....	...	....	0	...	...	21 x 21 x 26½	1/15	1,140	14	775	400	...
736	1,044.00	...	...	15,050	22,450	37,500	F-12	...	....	....	....	...	....	0	...	...	19½ x 28½ x 30½	...	...	(2) 9	1,150	300	...
824	550.00	...	...	11,250	17,750	29,000	F-12	...	10,000	17,500	27,500	...	...	0	...	...	33 x 32 x 19½	...	...	(2) 9	920	400	...

Duct Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
760	$450.00†	...	...	33,900	48,850	81,750	Freon	...	....	....	....	...	....	...	...	...	25½ x 32½ x 38½	...	...	..	1,875	...	...
V-1000 ...	983.00†	...	...	80,500	115,500	196,000	or	...	....	....	....	...	....	...	...	...	71½ x 68½ x 44½	...	...	(2) ..	4,200	...	...
V-2000 ...	1,231.00†	...	...	123,500	177,500	301,000	Water	...	....	....	....	...	....	...	...	...	77½ x 79 x 48	...	...	(2) ..	6,500	...	...
H-1000 ...	1,080.00†	...	...	80,500	115,500	196,000		...	....	....	....	...	....	...	...	...	25½ x 70 x 63½	...	...	(2) ..	4,200	...	...
H-2000 ...	1,246.00†	...	...	123,500	177,500	301,000		...	....	....	....	...	....	...	...	...	30½ x 78½ x 63¼	...	...	(2) ..	6,500	...	...

†Prices for low side only.

Norge

Norge Division, Borg-Warner Corp.
Detroit, Mich.

Functions—Cooling, dehumidifying, and cleaning.

Cabinet—Insulated steel cabinet, walnut finish.

Compressor — Norge compressor, water cooled. High side safety cutout. Pressure control.

Air Circulation—Air intake in rear panel, discharge in top. Fresh air intake provided.

Cooling System—Direct expansion. Copper cooling coils. Coils cannot be used with hot water.

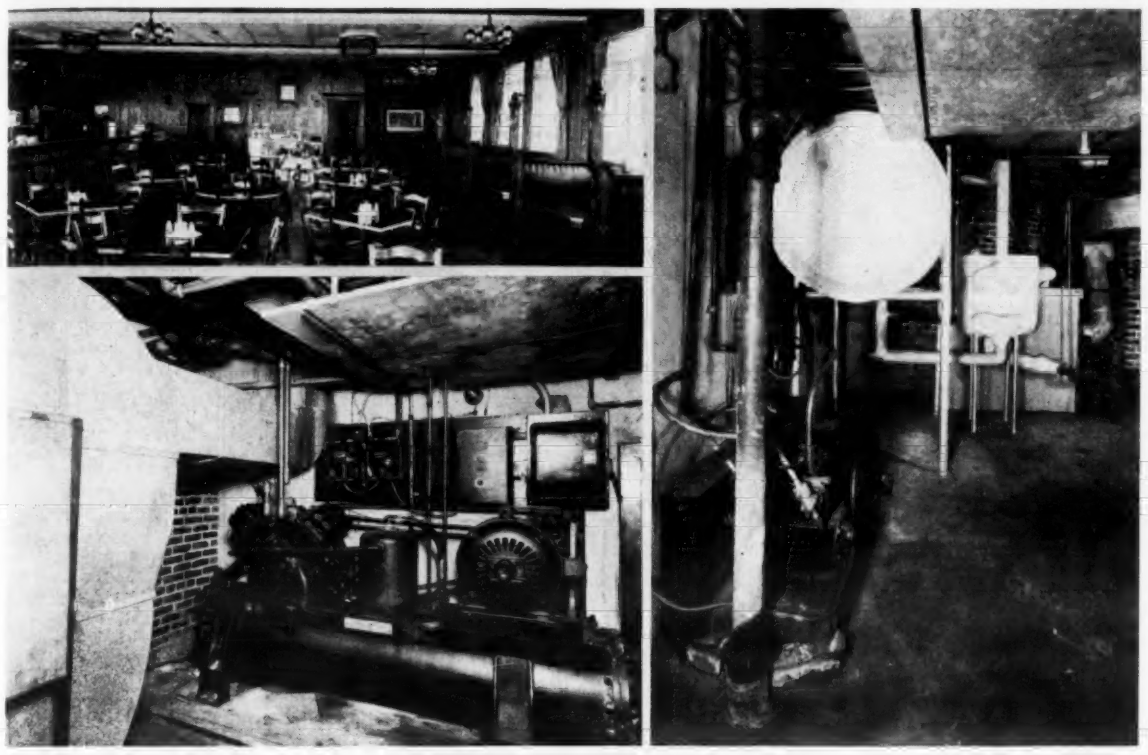
Air Cleaning Medium—Filter.

Controls—Thermostatic expansion valve and thermostat.

Self-Contained

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
R-100-F	$525.00	...	0	....	....	....	Freon	15	.....	650	1	...	0	0	626	696	35¾ x 38⅝ x 20⅞	1/20	...	(2) 6	425	625	...

Complete Modernization for a Washington Inn



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Top left view is of the Blue Bell's main floor bar, showing air distributing outlets in the ceiling. At the bottom is the 25-ton condensing unit, and duckwork. Picture on the right shows other refrigerating equipment, and boiler-burner unit.

Proprietors Find That Air Conditioning Produces Larger Checks, Pleased Patrons

WASHINGTON, D. C.—An increase of 25% in the size of the average check, plus better pleased and more patient patrons, are the outstanding benefits realized by the management of the Blue Bell Inn here from the installation of a Kelvinator year-'round air-conditioning system.

The Blue Bell Inn is a compact but well-patronized dine-and-drink establishment, located in an outlying residential district. It is one unit of a chain of similar establishments, and the executives of the chain, pleased with the results of the installation, have declared that they will never replace or remodel another unit without installing air-conditioning equipment.

The Inn is one-story building, with a basement. There is a bar and grill in the basement, and a bar on the main floor.

Cooling is supplied by a 25-ton Kelvinator air-conditioning system of the central-station type. Air distribution on the main floor is through specially constructed ceiling-type outlets of "stepped" construction, which throws the air about the room in all directions.

Conditioning of the basement is through a long air supply duct built along the center of the ceiling, and furred in to resemble a beam.

For heating, a Kelvinator boiler-burner unit is used to heat the air. The same mixing chamber and system of ducts is used for the heating system as is used for the cooling system.

Refrigeration for food preservation in the Blue Bell was also installed by Kelvinator, and includes a 3-hp. and a ½-hp. condensing unit for beer cooling and the kitchen refrigerators.

Detroit ASHVE Chapter Elects New Officers

DETROIT—Members of the Detroit chapter of American Society of Heating & Ventilating Engineers are holding their annual spring meeting and election of officers today, May 20, at Meadowbrook Country Club.

The annual meeting marks the last of this season's monthly ASHVE meetings, at which subjects pertaining to the heating, ventilating, and air-conditioning fields are discussed. Regular meetings will be resumed in October.

Program for the affair includes a golf tournament, baseball game, and other sports contests during the afternoon, and the banquet and election in the evening.

Nominees for the next year's offices, who will take their new posts at the meetings, are: R. K. Milward, president; Frank J. Seely, vice president; A. P. Darlington, treasurer, and G. H. Tuttle, secretary.

ASHVE Program Puts Spotlight on Heating

(Concluded from Page 1, Column 5)

Requirements of Buildings," by F. E. Giesecke.

"Heat Requirements of the Grant Building," by F. C. Houghten.

In charge of the program for the meeting are R. C. Bolsinger, general chairman; W. F. Smith, vice-chairman; M. F. Blankin, chairman, banquet committee; J. H. Hucker, chairman, entertainment committee; W. P. Culbert, chairman, golf committee; H. G. Black, chairman, registration committee; L. P. Hynes, chairman, finance committee; M. C. Gillett, chairman, ladies committee; and H. H. Erickson, chairman, publicity and transportation committee.

Automatic Products Issues Catalog Explaining Use Of Line of Controls

MILWAUKEE—Automatic Products Co. has recently brought out a catalog made up of bulletins in loose-leaf form, describing its line of controls and their use in the heating, ventilating, air conditioning, and refrigeration industries.

The bulletins list operation, application, capacity, and construction features of the units.

Described in the bulletins are A-P's humidity regulator, cooling and heating room thermostats, and high and low voltage room thermostats, refrigerant control valve, solenoid refrigerant and water valves, water control valves, thermostatic expansion valves, head pressure water valve, oil control valves, gas control valves, metering valve, relay, and relay set.

Trane Aims Program At Sale of Related Conditioner Parts

LA CROSSE, Wis.—Trane Co., air conditioning and heating manufacturer, recently inaugurated a promotional campaign designed to demonstrate the relation of the Trane products to each other in the installation of a complete system.

Heretofore, company officials explain, stress has been laid on the individual merits of each product so that not much effort has been directed toward publicizing their cooperative functions.

Five complete systems, which, according to company heads, cover the entire home heating and air conditioning market, ranging from orifice heating for the cottage, to complete winter and summer air conditioning for the home, will be advertised.

Trade paper advertising, direct-mail campaigns, dealer promotional work, and a new system bulletin entitled, "Heating and Air Conditioning in the Home," describing the five systems in detail will be used in the campaign.

Another point stressed, the report says, is the "undivided responsibility" angle.

Ewald Added to Staff of Young Radiator Co.

RACINE, Wis.—Warren Ewald has recently been added to the staff of Young Radiator Co., reports F. M. Young, company president.

Mr. Ewald has had considerable experience in manufacturing, research, and development in the heating, ventilating, and air-conditioning field.

CALIBRATED RANGE.. FIXED DIFFERENTIAL!
9100 Regulators for ICE CREAM CABINET CONTROL

The 9100 Regulator with Calibrated Range makes an ideal Ice Cream Cabinet control where an accurate and selective temperature adjustment is required.

A visible range scale, calibrated from −6° to +10° F. in increments of 2°, allows an indicative field setting to be made at any control point within the range. The differential is fixed at 2° and the calibration refers to the closing of contacts. Adjustment is by means of a convenient outside knob.

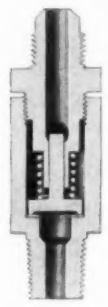
This 9100 Regulator (see cut) is of the temperature type, but the same feature can be furnished, if specified, for pressure controls applied to methyl chloride machines. All 9100 Regulators can be furnished with or without overload protection and with or without high pressure cut-out.

Write for booklet covering The 9100 Line

Export Dept., Regulator Division, H. M. Robins Company, 120 Madison Ave., Detroit, Mich., U.S.A.

SQUARE D EVERYWHERE
SQUARE D COMPANY
REGULATOR DIVISION, DETROIT, MICHIGAN
WESTERN DIVISION, LOS ANGELES, CALIFORNIA
SQUARE D COMPANY, CANADA LTD., TORONTO, ONTARIO

20 QUALITY FEATURES



(No. 11)

Servel Condenser Check Valves Prevent Water Wastage During Idle Periods.

THE HEART...

of every Air Conditioning system is the refrigeration compressor. It must be right! . . . Servel, a pioneer in low-pressure refrigeration, offers machine units in all popular sizes—with twelve models, from ½ tons to 20 tons, designed specifically for Air Conditioning. The time-proven dependability of these machines removes all doubt from the minds of the user, the contractor and the distributor . . . There may be an opening for a live dealer in your city. A letter or a wire will bring details.

SERVEL
COMMERCIAL REFRIGERATION
SERVEL, INC. *Commercial Refrigeration Division* EVANSVILLE, IND.

This modern 33-acre plant is the home of Servel Commercial Refrigeration and the world-famous Electrolux, the Servel Gas Refrigerator

There is no Substitute for Experience

Lipman

General Refrigeration Sales Co.
Beloit, Wis.

Functions—Suspended type: cooling and dehumidifying; cleaning optional on models CU-2001 and CU-4001. Suspended or duct type: cooling and dehumidifying; cleaning optional. Duct type: cooling and dehumidifying; cleaning optional.

Cabinet—Suspended type: Lipman insulated copper and brass cabinet, black-enamel finish, plated front. Models CU-2001 and CU-4001 have Lipman insulated steel cabinet with aluminum-enamel or optional finish. Suspended or duct type and duct type: Lipman insulated steel cabinet with aluminum-enamel finish.

Compressor—Duct type: Lipman 4-cylinder water-cooled compressor. Century motor. Cutler-Hammer motor starter. Minneapolis-Honeywell high side safety cutout. Minneapolis-Honeywell compressor control.

Blower—Suspended type: Switzer-Cummins propeller type, except CU-2001 and CU-4001, which are Buffalo Forge HVA type. Wagner split-phase motor, except M-16-C and F-16-C, which are Emerson split phase. Direct drive. Suspended or duct type and duct type: Buffalo Forge HVA blower. Wagner motor. Direct drive.

Air Circulation—Suspended type: air intake in rear, discharge in front; except CU-2001 and CU-4001, intake in side, discharge in side or top. No fresh air intake. Suspended or duct type: intake in side, discharge in side. No fresh air intake. Uni-flo grilles. Duct type: air intake in side, discharge in top or side. Fresh air intake provided in ducts.

Cooling System—Direct expansion. Circulating cold water available for special applications. Lipman copper coils.

Air Cleaning Medium—Filters.

Controls—Suspended type: thermostatic expansion valve. Thermostat and humidistat optional on CU models. Suspended or duct type: thermostatic expansion valve; humidistat and thermostat optional. Duct type: thermostatic expansion valve, water-regulating valve; humidistat and thermostat optional.

Special Features—Refrigerant heat interchanger; duct type self-contained.

Self-Contained Duct Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
5-2000	$.....	530	...	22,000	40,000	62,000	Freon	10	2⅜ x 3¼	470	5	4,700†	0	0	1,350	1,485	45⅝ x 52¼ x 30⅜	½	1,140	12	2,000	...	490
10-4000	.....	933	...	41,000	77,000	118,000	Freon	20	3¼ x 4	450	10	9,000†	0	0	2,500	2,665	56⅜ x 63¼ x 36½	1	865	15	4,000	...	880

†Condensing unit power input based on 75° water.

Suspended Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
M-10-C	$.....	40.1	0	1,950	5,150	7,100	CH_3Cl	...	....	....	....	...	...	0	56	70	13½ x 13½ x 18⅛	1/80	1,500	10	350	...	61
F-10-C	.....	40.1	0	1,950	5,150	7,100	Freon	...	....	....	....	...	...	0	56	70	13½ x 13½ x 18⅛	1/80	1,500	10	350	...	61
M-12-C	.....	71.3	0	3,200	8,500	11,700	CH_3Cl	...	....	....	....	...	...	0	80	100	17 x 17 x 19	1/40	1,000	12	500	...	69
F-12-C	.....	71.3	0	3,200	8,500	11,700	Freon	...	....	....	....	...	...	0	80	100	17 x 17 x 19	1/40	1,000	12	500	...	69
M-16-C	.....	114.2	0	3,100	14,800	17,900	CH_3Cl	...	....	....	....	...	...	0	117	140	20½ x 20½ x 21¾	1/20	1,150	16	1,000	...	113
F-16-C	.....	114.2	0	3,100	14,800	17,900	Freon	...	....	....	....	...	...	0	117	140	20½ x 20½ x 21¾	1/20	1,150	16	1,000	...	113
CU-2001	.....	530	0	22,000	41,000	62,000	Freon	...	....	....	....	...	...	0	485	560	20 x 48½ x 31⅜	⅓-½	860†	12	2,000	...	490
CU-4001	.....	933	0	41,000	77,000	118,000	Freon	...	....	....	....	...	...	0	...	...	.....	¼-1	860	15	4,000	1,000	880

Suspended or Duct Type

CU-2002	.....	530	0	22,000	41,000	62,000	Freon	...	....	....	....	...	...	0	485	560	20 x 48½ x 31⅜	⅓-½	860†	12	2,000	1,000	490
CU-4002	.....	933	0	41,000	77,000	118,000	Freon	...	....	....	....	...	...	0	...	...	.....	¾-1	860	15	4,000	1,000	880

†May be secured at 1,150 r.p.m.

American Blower

American Blower Corp., Detroit, Mich.

Functions—Remote floor type: heating, cooling, dehumidifying, and cleaning. Suspended or duct and duct types: heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet—Remote floor type: air-insulated steel cabinet, grained natural walnut finish. Suspended and duct type: American Blower Corp. insulated pressed-wood cabinet, derby green finish. Duct type: RH series—steel cabinet, beige synthetic enamel finish, not insulated; K series—steel cabinet, prime coat finish, insulation optional; R series—floor-type steel cabinet, beige lacquer finish, not insulated.

Blower—American Blower Corp. Sirocco fans. General Electric motor, direct-connected on remote floor type, V-belt drive on all others.

Air Circulation—Remote floor type: air intake in top, discharge in top; no fresh air intake, Sirocco discharge grille. Suspended or duct type: air intake in bottom side, discharge in top; no fresh air intake; no discharge grilles. Duct type: series RH—air intake in rear, discharge in front, fresh air intake in combined fresh air and return air duct; series K—air intake in rear, discharge in top, fresh air intake provided; series R—air intake in top, discharge in top, fresh air intake provided.

Cooling System—Either direct expansion or circulating cold water on all models. Aerofin tin-dipped copper cooling coils.

Heating System—Aerofin tin-dipped copper coils, can be used with hot water. Heating capacities: model O-45, 14,000 B.t.u.; O-60, 28,000; O-75, 42,000; RH112M11DS, 62,000; RH112H-11DS, 76,500; RH112M14DS, 90,500; RH112H14DS, 107,000; RH212M11DS, 115,000; RH212M14DS, 177,000; RH212-H11DS, 130,000; RH212H14DS, 210,000; R-35, 99,000; R-50, 146,000; R-75, 205,000; R-90, 276,000.

Type of Humidifier—American Blower Corp. spray type.

Air Cleaning Medium—Remote floor type: bronze-wool filter. Suspended or duct and duct types: Arco filters.

Controls—Remote floor type: water-regulating valve. Suspended or duct type: air by-pass dampers. Duct type: series K—air by-pass dampers.

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
O-45	$.....	....	....	24,750†	7,090	10,800	...	...	16,200†	6,725	16,200	2.75	5.5	0	185	...	30 x 34 x 10½	1/40	1,140	4½	300	...	...
O-60	.....	....	....	47,200†	13,820	20,900	...	...	32,400†	13,450	18,170	5.5	5.0	0	295	...	34 x 42 x 14	1/20	870	6	600	...	...
O-75	.....	....	....	74,700†	22,600	33,800	...	...	47,500†	20,980	28,120	9.2	3.0	0	465	...	38 x 48 x 18	1/20	700	7½	1,000	...	...

Suspended or Duct Type

B-112	$.....	226	Varies	....	....	....	...	...	....	....	....	...	...	..	‡	...	88 x 36 x 36	¾	1,750	12	1,700	...	...
B-212	.....	388	Varies	....	....	....	...	...	....	....	....	...	...	..	‡	...	88 x 64 x 36	1½	1,750	12	3,400	...	...
B-312	.....	604	Varies	....	....	....	...	...	....	....	....	...	...	..	‡	...	88 x 96 x 36	2	1,750	12	5,700	...	...
B-215	.....	732	Varies	....	....	....	...	...	....	....	....	...	...	..	‡	...	88 x 80 x 49	2	1,750	15	6,200	...	...
B-218	.....	996	Varies	....	....	....	...	...	....	....	....	...	...	..	‡	...	93 x 100 x 49	3	1,750	18	8,100	...	...
B-221	.....	1,320	Varies	....	....	....	...	...	....	....	....	...	...	..	‡	...	108 x 120 x 49	3	1,750	21	10,000	...	...

Duct Type

RH112M11DS	$.....	Varies	....	....	24,000	...	...	....	....	....	...	...	...	..	600	...	22⅞ x 47¼ x 55½	⅛	610	12	875	...	...
RH112H11DS	.....	Varies	....	....	32,800	...	...	....	....	....	...	...	...	..	600	...	22⅞ x 47¼ x 55½	¼	720	12	1,150	...	...
RH112M14DS	.....	Varies	....	....	37,000	...	...	....	....	....	...	...	...	..	730	...	22⅞ x 54⅝ x 55½	¼	640	12	1,350	...	...
RH112H14DS	.....	Varies	....	....	46,800	...	...	....	....	....	...	...	...	..	740	...	22⅞ x 54⅝ x 55½	⅓	720	12	1,650	...	...
RH212M11DS	.....	Varies	....	....	47,600	...	...	....	....	....	...	...	...	..	950	...	22⅞ x 64⅝ x 55½	⅓	660	12	1,750	...	...
RH212M14DS	.....	Varies	....	....	73,500	...	...	....	....	....	...	...	...	..	1,100	...	22⅞ x 74⅝ x 55½	½	670	12	2,700	...	...
RH212H11DS	.....	Varies	....	....	51,500	...	...	....	....	....	...	...	...	..	965	...	22⅞ x 64⅝ x 55½	½	740	12	2,100	...	...
RH212H14DS	.....	Varies	....	....	86,800	...	...	....	....	....	...	...	...	..	1,120	...	22⅞ x 74⅝ x 55½	¾	795	12	3,500	...	...
K-2	$.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	51 x 39⅜ x 74	½	...	12	1,000	...	...
K-2½	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	51 x 39⅜ x 79	¾	...	15	1,500	...	...
K-3	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	51 x 51 x 87	1	...	18	2,400	...	...
K-3½	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	51 x 63 x 93	1½	...	21	3,500	...	...
K-4	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	51 x 75 x 100	1½	...	24	4,600	...	...
K-4½	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	63 x 76⅜ x 107	2	...	27	6,000	...	...
K-5	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	89 x 89 x 113	3	...	30	7,500	...	...
K-5½	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	‡	...	89 x 89 x 120	3	...	33	10,000	...	...
R-35	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	1,050	...	66 x 44⅛ x 33⅜	¼	1,100	7½	1,300	...	...
R-50	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	1,400	...	66 x 53⅛ x 38⅜	⅓	820	9	1,700	...	...
R-75	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	1,850	...	66 x 74⅜ x 38⅜	¾	840	9	2,500	...	...
R-90	.....	Varies	....	....	....	...	...	....	....	....	...	...	...	..	2,400	...	66 x 72⅛ x 52⅛	1	660	12	3,500	...	...

*Cold water used. †Grams per hour. ‡Varies according to amount of coil surface.

Ilg

Ilg Electric Ventilating Co.
Chicago, Ill.

Functions—Self-contained models: cooling, dehumidifying, and optional cleaning. Remote floor type: heating, cooling, humidifying, dehumidifying, and cleaning. Suspended type: cooling and dehumidifying.

Cabinets—Self-contained: model 11, steel cabinet; model 30, wood cabinet. Burled-walnut finish. Cabinets insulated. Remote type: steel cabinet, burled-walnut finish. Suspended type: Ilg steel cabinet, ivory finish, not insulated.

Compressor—Two cylinders; model 11, water cooled; model 30, air cooled. Manual control.

Blowers—Self-contained: Ilg blower, with Ilg direct-drive motor. Remote type: Ilg twin-centrifugal multivane blower with Ilg direct-drive motor. Suspended type: propeller fan blower, with Ilg shaded-pole motor on 135-CU; Ilg capacitor motor on all others. Direct drive.

Air Circulation—Self-contained: air intake in back, discharge in front; no fresh air intake. Remote type: air intake in lower front, discharge in top; no fresh air intake; directional discharge grille. Suspended type: intake in rear, discharge in front; no fresh air intake.

Cooling System—Direct expansion. Ilg copper cooling coils.

Heating System—Ilg copper coils, can be used with hot water. Heating capacity: model 500-RC, 45,800 B.t.u.

Air Cleaning Medium—Filter.

Controls—Thermostatic expansion valve on model 500-RC; thermostatic expansion valve and water-regulating valve on models 11 and 30; thermostatic expansion valve on suspended units.

Special Features—Self-contained type: rotatable circular directional discharge grille, water-cooled motor. Suspended type: circular directional discharge grille.

Self-Contained

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
11	$.....	92	0	....	....	6,000	Freon	6	$1^{13}/_{16}$ x 1⅜	...	½	600	0	0	350	...	43 x 29¼ x 18½	1/40	1,140	10	300	550	...
30	.....	92	0	....	....	7,200	Freon	6	$1^{13}/_{16}$ x 1⅜	...	1	1,000	0	0	350	...	43 x 29¼ x 22	1/40	1,140	10	300	550	...

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
500-RC	$.....	83.3	83.3	3,340	6,450	9,790	Freon or CH_3Cl	...	....	....	....	...	...	...	...	...	33 x 32 x 14	1/16	¶	(2) 6	500	375	115

Suspended Type

135-CU	$.....	59	0	4,000†	7,750†	11,750†	Freon or	...	....	....	....	...	...	0	150	...	21¼ x 21¼ x 12	1/20	855‡	13	600‡	490‡	...
175-CU	.....	85	0	7,100	13,800	20,900	CH_3Cl	...	....	....	....	...	...	0	190	...	24¼ x 24¼ x 12	⅛	855	16	1,220	690	...
195-CU	.....	115	0	10,300	20,100	30,400	or	...	....	....	....	...	...	0	240	...	27¼ x 27¼ x 12	⅛	855	19	1,970	820	...
255-CU	.....	190	0	15,100	29,400	44,500	Water	...	....	....	....	...	...	0	320	...	34¼ x 34¼ x 12	⅓	685	25	2,500	630	...

†Ratings given with blower speeds of 855 r.p.m. Ratings at 1,140 r.p.m. are 4,750 B.t.u. dehumidification, 9,350 B.t.u. sensible heat, 14,100 B.t.u. total. ‡Also operates at 1,140 r.p.m., giving 810 c.f.m. and 660 f.p.m. ¶Three speeds, 1,140, 850, and 690 r.p.m.

University of Illinois Reports on Research Showing Cost of Comfort Cooling and How It Can Be Made Less Expensive

URBANA, Ill.—Operating costs on various types of comfort cooling equipment, and various factors which can be employed to reduce such costs, were among the chief matters discussed at the recent conference to educate "laymen" on air conditioning, conducted by the Department of Mechanical Engineering, College of Engineering, University of Illinois.

Insulation, awnings, and efforts to reduce the amount of heat coming into a house are necessary to reduce the cost of cooling and make the householder "more satisfied with the bill he has to pay," Prof. H. J. Macintire of the University of Illinois told the conference.

"Face the facts," he urged. "You've either got to 'calk' or do a lot of 'pumping out'. Results will be a compromise between the two—insulation and other steps to stop heat 'leaking' into the house, and cooling to 'bail out' the heat."

Absorption of Solar Heat

Solar radiation on walls and windows puts considerable heat into the a house. A cement-colored surface absorbs four-tenths of the radiation, a tar colored surface nine-tenths, he said. The ordinary outside wall has a heat lag of about three hours. The inside surface is cool through the morning, then continues to pass heat in the evening.

Awnings stop 70 to 75% of solar radiation through the windows. Venetian blinds are not quite so effective. Buff colored shades inside turn 50% of the radiation.

Other Heat Load Factors

Hot air leaks into the residence through cracks about doors and windows. People each give off 400 B.t.u. per hour of heat while sitting and more when active, and they also increase the humidity. Illumination adds heat. Work in the kitchen gives off much heat and moisture. Water heaters and motors contribute heat. All these factors must be counteracted, Professor Macintire explained.

Spot cooling or room cooling may be more satisfactory in many cases than complete house cooling with other factors unchanged, the speaker suggested.

"At least," he said, "it is far better to consider from the outset that it may be quite expensive to cool the ordinary house as we see it."

Use of Spot Coolers

Spot coolers have a field of use in radiator heated houses and in others where cost of installing a complete cooling system utilizing warm air heating ducts makes a central system undesirable, Prof. M. K. Fahnestock of the University of Illinois suggested.

He reported cooling tests made at the university's research residence during the last four summers. Two unit coolers were tested in 1933. Although both were ice cooled, similar results can be expected with mechanical refrigeration, he said.

Results with Unit Cooler

A unit cooler in one room shut off from the rest of the house maintained an average temperature drop of 11 degrees. Humidity was held to 50 to 55%, while in adjoining rooms it was 65 to 70%.

A larger unit cooler located in the same room at one side of the house with doors to other rooms left open was found to cool the entire first floor satisfactorily. Temperatures in all rooms were within three degrees of the 79° F. temperature in the room where the cooler was located. Humidity was reduced to 50%.

In 1932, 1934, and 1935 the house was air conditioned from a central plant utilizing the building's warm air heating ducts for circulation. Ice water, mechanical refrigeration, and water from the city mains were tested as sources of cooling.

Mechanical Refrigeration Cheapest

Mechanical refrigeration was found most satisfactory on basis of operating cost, temperature, and humidity reductions obtained. Original cost of equipment or of its installation was not considered.

Total space cooling in the eight-room house was 14,170 cubic feet; 7,300 on the first story and 6,870 on the second. Calculations according to the 1934 A.S.H.V.E. Guide showed a cooling load of 37,500 B.t.u. per hour with outdoor temperature 91° F. and indoor temperature 80° F.

In 1932 chilled water from a tank of 4,000 pounds ice capacity was passed through cooling coils in the return duct of the forced air system. The amount of air passing over the coils was controlled by a thermostatically-operated by-pass damper. Dampers in the distribution ducts balanced the cooling load to various rooms.

Chilled water entered the coil at 35° F. Dehumidification occurred through condensation of moisture on the coil, reducing the house relative humidity to 45° F. Cost per hour per ton of refrigeration delivered was 18½ cents, based upon ice at $4 ton.

Tests with Mechanical Cooling

In 1934 mechanical refrigeration was used. A 4-cylinder Freon compressor with a rating of 30,000 B.t.u. per hour was driven by a 3-hp. motor. The air circulation fan was in continuous operation, and operation of the compressor was regulated by a thermostat.

Air temperature was maintained at 80° F. and humidity at 45%. Total cost per hour per ton of refrigeration delivered was 5½ cents based upon electric power at 3.1 cents per kilowatt hour.

During 1935 water from the city mains was used for cooling. A larger coil than with either of the other systems was necessary, since the water temperature was 58° F. Control was through a thermostat which opened and closed an electric valve in the water line.

Air temperature was reduced to 80° F., but because of the high coil temperature, dehumidification was unsatisfactory. Humidity was never less than 63%. Total cost per hour per ton of refrigeration delivered was 6½ cents based on water cost of 33 cents per 1,000 gallons.

Effect of Awnings

While making these tests, the research workers also investigated benefits of awnings, circulation of night air with the cooling plant turned off, and made studies of season temperatures.

Awnings on all windows exposed to the sun reduce the cooling load 30%, they found. Circulation of night air through the cooling ducts with second story windows open cuts the cooling cost about 16 per cent. Season cost of cooling cannot be established in advance, as in the last dozen years some summers have been seven times as great in total severity as others.

"As far as most of us are concerned, air conditioning represents a new development. Underlying requirements are knowledge concerning the human body and how it reacts to the atmospheric environment in which it exists," declared F. C. Houghten, director of the American Society of Heating and Ventilating Engineers research laboratory in Pittsburgh, Pa.

Properties Affecting Comfort

Air properties which affect comfort and health are: temperature, moisture content, motion, dust content, freedom from odors, and freedom from other harmful vapors, gases, bacteria, or harmful substances, he explained.

Likening the body to a locomotive, he said that instead of coal and draft, the body takes in food and oxygen, and through oxidation maintains a temperature of about 98.6° F. and energy for life processes. In the average person these produce about 400 B.t.u. of heat which must be dissipated from the body. In cold weather more heat is produced, warmer clothing worn, air temperatures artificially raised.

Increase Evaporation of Body

In hot weather the body's only recourse is to increase the rate of heat dissipation by evaporation. At normal temperature persperation is not noticable. At higher temperatures it is available in quantities which are uncomfortable. In winter 66° F. with 100% humidity, 70° with 50% humidity, 74° F. with 10% humidity has been found comfortable.

In summer 75° F. with 100% humidity, 78° F. with 60% humidity, 84° F. with 20% humidity is comfortable. Increased air motion increases feeling of coolness at any temperature, but must be limited to such velocities as do not annoy people at their occupations.

Filtration of Pollen

Filtration of pollen from the air relieves hay fever sufferers in a half hour, Dr. W. H. Welker of the University of Illinois College of Medecine in Chicago reported of tests conducted there during the past five years. Persons with pollen asthma are also relieved, but in a longer period of time, he said.

Cellulose filters were used to remove 99% of the pollen. Relatively slow air speeds were used, and special care had to be taken to prevent mechanical vibration of the filters. Vibration resulted in sifting, he said. Even though patients spent only nights in a pollen-free room, their efficiency was increased.

Tests were made in a hospital ward, but the doctor stated that individual machines for room air filtration are successful, and filters have successfully been applied to air filtration through a forced air heating system's ducts. Efficient filtration, large surface, low speed with sufficient volume, and no vibration are important.

New Type Psychrometer Introduced by Friez

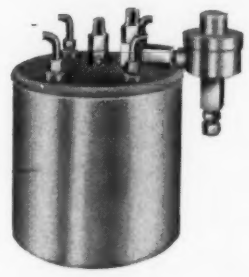
BALTIMORE—Julian P. Friez & Sons, Inc., manufacturer of weather instruments, has recently brought out a new hand-aspirated psychrometer, designed for use in making measurements of relative humidity in public buildings, cramped quarters, or wherever the use of a sling psychrometer is inconvenient or undesirable.

Wet and dry bulbs of the psychrometer are aspirated by means of induced air, which is drawn across the bulbs at uniform high velocity. The hand pump forces air through a venturi tube, which draws secondary air from the outside across the wet and dry thermometer bulbs.

Cover of the chamber in which these bulbs are enclosed may be opened to facilitate pouring water to the wet bulb, and forms a thermo shield for the bulbs. The thermometers are fastened to the hinged lid. Case of the instrument serves as a handle when in use, as protection for the thermometers when not.

Use of the instrument is simple. The operator merely operates the bulb pump and watches the thermometer until the absolute correct condition is reached. Accurate readings, it is asserted, can be obtained with the instrument within a maximum of two minutes.

Get This Beer Cooling Business



The Season for Beer Cooling is rapidly approaching and there is every indication that more new coolers will be installed in 1936 than ever before.

As in past years, Temprite Instantaneous Beer Cooler by reason of its outstanding performance will be the choice of the majority of Licensees who will purchase during the current season.

Lose no time—get after your prospects now—take advantage in your sales approach of the outstanding performance which belongs to Temprite exclusively. Big profitable business awaits your earnest efforts.

TEMPRITE PRODUCTS CORPORATION
1349 EAST MILWAUKEE AVE. - DETROIT, MICHIGAN
ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

ANY TYPE OR SIZE JOB - - - FITS

Lipman

AIR CONDITIONING

PRINCIPAL AIR LINES ARE USING LIPMAN AIR CONDITIONING

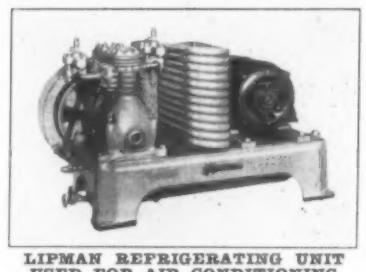
EQUIPMENT

OVER 1600 RAILROAD COACHES ARE AIR CONDITIONED BY LIPMAN

LIPMAN Air Conditioning distributors have several advantages. No matter what size or type jobs they go after, LIPMAN distributors can supply equipment that will meet the requirements exactly.

LIPMAN SELF CONTAINED UNITS ARE MADE IN SEVERAL SIZES

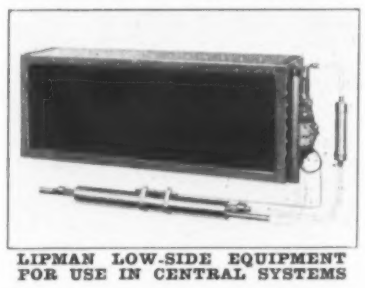
Wherever it is desired to reduce heat and humidity and to shut out dirt and noise LIPMAN Air Conditioning equipment will serve efficiently, dependably and economically.



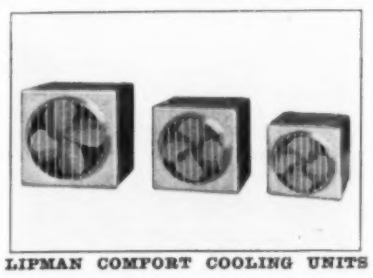
LIPMAN REFRIGERATING UNIT USED FOR AIR CONDITIONING

ONE TYPE OF LIPMAN SUSPENDED DOUBLE BLOWER UNIT

In airliners, railroad cars, theatres, hotels, auditoriums, restaurants, factories, offices, laboratories, stores, shops, warehouses, mortuaries and homes, in all parts of the world, LIPMAN equipment is supplying clean, healthful air at a comfortable temperature and at the desired rate of circulation.

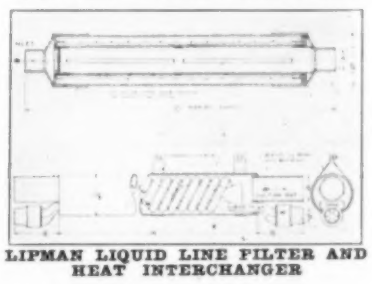


LIPMAN LOW-SIDE EQUIPMENT FOR USE IN CENTRAL SYSTEMS



LIPMAN COMFORT COOLING UNITS

If you want to handle a line that is backed by practical engineering, modern design, precision workmanship and the resources and experience of a company that has devoted itself to the pioneering of air conditioning development, write for information covering the LIPMAN distribution plan. It furnishes LIPMAN distributors with every modern advantage toward securing big-volume, profitable air conditioning business.



LIPMAN LIQUID LINE FILTER AND HEAT INTERCHANGER

GENERAL REFRIGERATION SALES COMPANY
Dept. AF-5, Beloit, Wisconsin, U.S.A.

Trane

The Trane Co., La Crosse, Wis.

Functions—Remote floor type and remote floor or suspended type: heating, cooling, humidifying, dehumidifying, and cleaning. Suspended type: 2DE models, cooling and dehumidifying; 4DE models, cooling, dehumidifying, and cleaning; all others, heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinets—Remote floor type, Trane insulated steel cabinet, brown crinkle baked-enamel finish, except 8102DE, aluminum finish. Remote floor or suspended type: Trane insulated steel cabinet with aluminum finish. Suspended type: 2DE and 4DE models, Trane insulated steel cabinet, with brown crinkle baked-enamel finish. All others, Trane insulated steel cabinet with aluminum finish.

Blower—Remote floor type and remote floor or suspended type: Trane FC blower. Standard Mfg. Co. motor, direct drive. Suspended type: 2DE models, Trane propeller fan. Standard Mfg. Co. motor, direct drive. All other suspended units, Trane FC blower, Standard Mfg. Co. motor, direct drive.

Air Circulation—Remote floor type: air intake in front, except model 8102DE, in rear. Discharge in top, except 8102DE, in front. Fresh air intake provided. Trane Free Flo grille. Remote floor or suspended type: intake in rear, discharge in front. Fresh air intake provided. Trane Free Flo grille. Suspended type: 2DE models, intake in rear, discharge in front. No fresh air intake. Trane Free Flo grille. 4DE models, intake in side or rear, discharge in front. Fresh air intake provided on order. Trane Free Flo grille. All other suspended units: intake in rear, discharge in front. Fresh air intake provided. Trane Free Flo grille.

Cooling System—Direct expansion or circulating cold water. Trane copper coils.

Heating System—Trane copper coils, can be used with hot water. Heating capacities: model 52-4DE, 31,000 B.t.u.; 62-4DE, 44,400; 92-6DE, 85,000; 102-6DE, 125,000; 112-6DE, 154,000; 122-6DE, 200,000; 810-2DE, 137,000; 810-4DE, 275,000; 810-6DE, 440,000; 810-8DE, 520,000; 81-10DE, 710,000; 81-12DE, 790,000; 42-00DE, 29,000; 62-0DE, 57,500; 82-1DE, 83,000; 82-1A-DE, 88,000; 82-2DE, 115,000; 82-2A-DE, 138,000; 82-3DE, 165,000; and 82-3A-DE, 175,000.

Type of Humidifier—Spray.

Air Cleaning Medium—Trane copper wool.

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
52-4DE	$.....	96	48	....	....	13,200	...	...	....	....	15,900	5.8	....	...	200	260	30 x 52¼ x 9¼	1/30	975	(2) 4½	300	...	...
62-4DE	.....	180	90	....	....	21,000	...	...	....	....	26,800	9.1	....	...	335	395	32 x 58¼ x 11½	1/20	700	(2) 6	500	...	...
92-6DE	.....	480	160	....	....	48,500	...	...	....	....	57,400	14.5	....	...	530	590	38 x 70¼ x 14⅝	1/8	500	(2) 8	1,000	...	...
102-6DE	.....	625	208	....	....	71,000	...	...	....	....	92,500	18.7	....	...	660	720	38 x 82¼ x 14⅝	1/6	750	(2) 8	1,500	...	...
112-6DE	.....	810	270	....	....	85,500	...	...	....	....	108,000	21.0	....	...	740	800	46 x 90¼ x 18⅛	1/4	515	(2) 10	2,000	...	...
122-6DE	.....	960	320	....	....	112,000	...	...	....	....	129,000	24.0	....	...	1,040	1,100	46 x 100¼ x 18⅛	1/3	645	(2) 10	2,500	...	...
810-2DE	.....	768	192	....	....	86,000	...	...	....	....	86,000	21.0	....	...	1,300	1,450	62¾ x 70 x 20⅝	1/2	1,084	(2) 8	2,000	...	...
8104-DE	$.....	1,368	342	...	...	172,000	...	...	....	....	172,000	30.5	....	...	1,700	1,900	67¾ x 80 x 24⅝	3/4	646	(2) 12	4,000	...	...
8106-DE	.....	2,500	625	...	...	276,000	...	...	....	....	276,000	35.5	....	...	2,450	2,700	75 x 98 x 30⅝	1	475	(2) 12	6,000	...	...
8108-DE	.....	2,500	625	...	...	325,000	...	...	....	....	325,000	40.0	....	...	2,800	3,100	75 x 98 x 30⅝	2	640	(2) 15	8,000	...	...
8110-DE	.....	3,840	960	...	...	440,000	...	...	....	....	440,000	45.0	....	...	3,750	4,100	93½ x 116 x 36⅝	2	466	(2) 18	10,000	...	...
8112-DE	.....	3,840	960	...	...	48,500	...	...	....	....	48,500	49.0	....	...	4,500	4,900	93½ x 116 x 36⅝	3	553	(2) 18	12,000	...	...
Suspended Type																							
8104-DE	$.....	1,368	342	...	...	172,000	...	...	....	....	172,000	30.5	....	...	1,700	1,900	26¼ x 94 x 53	3/4	646	(2) 12	4,000	...	...
8106-DE	.....	2,500	625	...	...	276,000	...	...	....	....	276,000	35.5	....	...	2,450	2,700	34¾ x 110 x 59	1	475	(2) 15	6,000	...	...
8108-DE	.....	2,500	625	...	...	325,000	...	...	....	....	325,000	40.0	....	...	2,800	3,100	34¾ x 110 x 59	2	640	(2) 15	8,000	...	...
8110-DE	.....	3,840	960	...	...	440,000	...	...	....	....	440,000	45.0	....	...	3,750	4,100	42¾ x 130 x 72	2	466	(2) 18	10,000	...	...
8112-DE	.....	3,840	960	...	...	48,500	...	...	....	....	48,500	49.0	....	...	4,500	4,900	42¾ x 130 x 72	3	553	(2) 18	12,000	...	...
12-2DE	$.....	48	0	....	....	11,200	...	....	....	....	13,100	8.2	.4	0	...	100	18 x 17¼ x 18½	1/30	850	12½	870	870	..
15-2DE	.....	75	0	....	....	15,800	...	....	....	....	17,800	9.3	.4	0	...	135	21 x 20¼ x 18½	1/10	850	15½	920	590	..
18-2DE	.....	108	0	....	....	24,300	...	....	....	....	27,230	11.7	.4	0	...	180	24 x 23¼ x 18½	1/10	850	18	1,720	760	..
24-2DE	.....	192	0	....	....	43,400	...	....	....	....	48,200	14.7	.4	0	...	260	30 x 29¼ x 21½	1/10	850	18	2,000	500	..
105-4DE	.....	144	0	....	....	13,200	...	....	....	....	15,900	5.8	....	0	200	230	16¼ x 24½ x 31	..	850	6	250	...	..
106-4DE	.....	144	0	....	....	16,900	...	....	....	....	21,500	7.5	....	0	205	235	16¼ x 24½ x 31	..	850	(2) 6	430	...	..
107-4DE	.....	192	0	....	....	21,000	...	....	....	....	26,700	8.3	....	0	240	270	16¼ x 30½ x 34	..	850	8	575	...	..
108-4DE	.....	192	0	....	....	31,600	...	....	....	....	40,000	15.8	....	0	245	275	16¼ x 30½ x 34	..	850	(2) 8	990	...	..
42-00DE	.....	77	38.5	....	....	13,400	...	....	....	....	13,500	5.8	....	..	...	190	13⅞ x 27⅛ x 26⅛	1/15	925	(2) 6	370	...	..
62-0DE	.....	255	85	....	....	30,500	...	....	....	....	30,800	10.4	....	..	...	300	19½ x 35⅛ x 34⅛	⅛	815	(2) 8	750	...	..
82-1DE	.....	512	128	....	....	52,000	...	....	....	....	52,000	12	....	..	...	750	26¼ x 46¾ x 47	¼	737	(2) 10	1,125	...	..
82-1A-DE	.....	512	128	....	....	55,000	...	....	....	....	55,000	13	....	..	...	750	26¼ x 46¾ x 47	¼	802	(2) 10	1,250	...	..
82-2DE	.....	680	170	....	....	76,000	...	....	....	....	76,000	18	....	..	...	995	26¼ x 59 x 53	¼	605	(2) 12	1,500	...	..
82-2A-DE	.....	680	170	....	....	86,000	...	....	....	....	86,000	21	....	..	...	995	26¼ x 59 x 53	½	735	(2) 12	2,000	...	..
82-3DE	.....	1,024	256	....	....	107,000	...	....	....	....	107,000	24	....	..	...	1,250	26¼ x 77¼ x 47	½	737	(4) 10	2,250	...	..
82-3A-DE	.....	1,024	256	....	....	111,000	...	....	....	....	111,000	28.5	....	..	...	1,250	26¼ x 77¼ x 47	½	802	(4) 10	2,500	...	..

Peerless

Peerless Ice Machine Co., Chicago, Ill.

Functions—Cooling and dehumidifying.

Cabinet—Insulated steel cabinet, any finish.

Blower—Peerless blowers. Model 1TAC, No. 6PHV; 2TAC, 9PHV; 3TAC, 10PHV; 4TAC, 5TAC, and 6TAC, 11PHV; 7½TAC, two 112; 10TAC, 12½TAC, and 15TAC, two 115; 17½ TAC and 20TAC, three 115; 1TACC, 6PVH; 2TACC, 9PVH; 3TACC, 10PVH; 4TACC, 5TACC, and 6TACC, 11PVH; 7½TACC, two 112; 10TACC, 12½TACC, and 15TACC, two 115; 17½ TACC and 20TACC, three 115. Peerless Electric Co. motors. Models numbered through 6 are direct drive; 7½ and larger are belt drive.

Cooling System—Direct expansion. Peerless copper coils.

Controls—Thermostatic expansion valve.

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
1-TAC	$227.25	90	0	4,000	8,000	12,000	Any	...	....	....	....	...	....	0	255	335	30 x 30 x 16	1/10	850	6¼	710	...	...
2-TAC	304.80	182.5	0	8,000	16,000	24,000	Any	...	....	....	....	...	....	0	330	420	34 x 32 x 18	1/8	850	7¾	1,200	...	...
3-TAC	394.80	267	0	12,000	24,000	36,000	Any	...	....	....	....	...	....	0	415	515	36 x 45 x 18	1/4	850	9	2,200	...	...
4-TAC	496.72	364	0	16,000	32,000	48,000	Any	...	....	....	....	...	....	0	590	700	43 x 45 x 18	1/2	500	10⅝	2,750	...	...
5-TAC	537.00	450	0	20,000	40,000	60,000	Any	...	....	....	....	...	....	0	620	730	43 x 46 x 21	1/2	690	10⅝	3,600	...	...
6-TAC	584.45	540	0	24,000	48,000	72,000	Any	...	....	....	....	...	....	0	650	770	45 x 47 x 24	1/2	690	10⅝	3,600	...	...
7½-TAC	750.60	680	0	30,000	60,000	90,000	Any	...	....	....	....	...	....	0	875	995	58 x 60 x 30	3/4	535	(2) 12	4,400	...	...
10-TAC	964.40	900	0	40,000	80,000	120,000	Any	...	....	....	....	...	....	0	1,105	1,225	64 x 64 x 30	3/4	404	(2) 15	5,960	...	...
12½-TAC	1,111.25	1,132	0	50,000	100,000	150,000	Any	...	....	....	....	...	....	0	1,260	1,380	65 x 78 x 30	1	448	(2) 15	7,500	...	...
15-TAC	1,247.50	1,352	0	60,000	120,000	180,000	Any	...	....	....	....	...	....	0	1,375	1,500	66 x 75 x 36	1½	495	(2) 15	8,920	...	...
17½-TAC	1,546.00	1,583	0	70,000	140,000	210,000	Any	...	....	....	....	...	....	0	1,705	1,830	67 x 88 x 36	1½	434	(3) 15	10,350	...	...
20-TAC	1,681.50	1,800	0	80,000	160,000	240,000	Any	...	....	....	....	...	....	0	1,800	1,940	68 x 84 x 42	2	468	(3) 15	12,000	...	...
Suspended Type																							
1-TACC	$239.50	90	0	4,000	8,000	12,000	Any	...	....	....	....	...	....	0	256	336	16 x 30 x 24	1/10	850	6¼	710	...	..
2-TACC	317.90	182.5	0	8,000	16,000	24,000	Any	...	....	....	....	...	....	0	325	415	18 x 32 x 28	⅛	850	7¾	1,200	...	..
3-TACC	412.50	267	0	12,000	24,000	36,000	Any	...	....	....	....	...	....	0	410	510	18 x 45 x 29	¼	850	9	2,200	...	..
4-TACC	507.90	364	0	16,000	32,000	48,000	Any	...	....	....	....	...	....	0	545	650	18 x 45 x 36	½	500	10⅝	2,750	...	..
5-TACC	552.50	450	0	20,000	40,000	60,000	Any	...	....	....	....	...	....	0	580	690	21 x 46 x 36	½	690	10⅝	3,600	...	..
6-TACC	598.60	540	0	24,000	48,000	72,000	Any	...	....	....	....	...	....	0	615	725	24 x 47 x 36	½	690	10⅝	3,600	...	..
7½-TACC	760.00	680	0	30,000	60,000	90,000	Any	...	....	....	....	...	....	0	795	910	30 x 60 x 48	¾	535	(2) 12	4,400	...	..
10-TACC	966.40	900	0	40,000	80,000	120,000	Any	...	....	....	....	...	....	0	980	1,100	30 x 64 x 54	¾	404	(2) 15	5,960	...	..
12½-TACC	1,109.40	1,132	0	50,000	100,000	150,000	Any	...	....	....	....	...	....	0	1,125	1,250	30 x 78 x 54	1	448	(2) 15	7,500	...	..
15-TACC	1,247.30	1,352	0	60,000	120,000	180,000	Any	...	....	....	....	...	....	0	1,235	1,360	36 x 75 x 54	1½	495	(2) 15	8,920	...	..
17½-TACC	1,538.00	1,583	0	70,000	140,000	210,000	Any	...	....	....	....	...	....	0	1,505	1,635	36 x 88 x 54	1½	434	(3) 15	10,350	...	..
20-TACC	1,680.60	1,800	0	80,000	160,000	240,000	Any	...	....	....	....	...	....	0	1,620	1,760	42 x 84 x 54	2	468	(3) 15	12,000	...	..

Thermal Units

Thermal Units Mfg. Co.
Chicago, Ill.

Functions — Self-contained type: cooling, dehumidifying, and cleaning; heating and humidifying available on models 50-SC, 100-SC, and 150-SC. Suspended type: heating, cooling, and dehumidifying.

Cabinet—Self-contained type: Thermal Units steel cabinet, buried walnut or crinkle-lacquer finish, insulated. Suspended type: Thermal Units steel cabinet, aluminum finish, not insulated.

Compressor — Self-contained type: Thermal Units eight-cylinder compressor, air cooled on model 58-R, water cooled on SC models. Century, Emerson, or Wagner motor. Trumbull Electric Co. overload protection. Penn high side safety cut-out. Pressure-type compressor control.

Blower—Self-contained type: Torrington aluminum blower. Baldor motor, direct drive on models 58-R and 50-SC. No blower motor, belt drive on 100-SC and 150-SC. Suspended units: Thermal Units four-blade propeller fans. Baldor blower motor, direct drive.

Air Circulation—Self-contained type: air intake in sides, air discharge in top. Fresh air intake optional. Uniflo discharge grille. Suspended type: air intake in rear, discharge in front. No fresh air intake or discharge grille.

Cooling System — Self-contained type: direct expansion Thermal Units copper coils. Suspended type: direct expansion or circulating cold water. Thermal Units one-piece aluminum casting coils.

Heating System — Self-contained type: Thermal Units copper coils, can be used with hot water. Heating capacities: model 50-SC, 18,000 B.t.u.; 100-SC, 36,000; 150-SC, 54,000. Suspended units: Thermal Units one-piece cast aluminum coils, can be used with hot water. Heating capacities: model 12, 41,300; 16, 73,100; 20, 133,100; 24, 195,600; 30, 285,300.

Type of Humidifier—Spray.

Air Cleaning Medium—Wilson & Co. filter.

Controls—Self-contained type: thermostatic expansion valve; humidistat, thermostat, liquid line solenoid valve, and air by-pass dampers if desired; water-regulating valve on SC models. Suspended type: thermostatic expansion valve or float valve; liquid line solenoid valve; thermostat if desired.

Self-Contained

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
58-R	$395.00	60	0	1,620	3,780	5,400	Freon	5	9/16 x ⅞	1,750	½	640	0	0	376	450	40 x 35 x 17	1/15	1,150	7½	290	545	120
50-SC	375.00	60	40	1,800	4,200	6,000	Freon	5	9/16 x ⅞	1,750	½	640	18,000	12	330	400	36 x 30 x 14	1/20	1,150	6	300	545	60
100-SC	550.00	120	80	3,600	8,400	12,000	Freon	10	25/32 x 1 1/16	1,150	1	1,080	36,000	24	525	650	45 x 35 x 18	0	1,150	(2) 9½	600	500	0
150-SC	675.00	180	120	5,400	12,600	18,000	Freon	12	25/32 x 1 1/16	1,750	1½	1,575	54,000	24	600	725	49 x 35 x 18	0	1,150	(2) 9½	900	500	0
Suspended Type																							
12	$125.00	42	42	2,592	6,048	8,640	†	...	3,600	7,200	10,800	6	....	0	150	220	15 x 21¼ x 28	1/10	1,750‡	12	975	975	120
16	148.00	70	70	4,608	10,752	15,360	†	...	6,400	12,800	19,200	9	....	0	215	295	19 x 25¼ x 31	⅛	1,150‡	15	1,740	1,020	125
20	205.00	145	145	7,200	16,800	24,000	†	...	10,000	20,000	30,000	12	....	0	275	365	22¾ x 29¼ x 31	⅛	1,150‡	19	2,710	970	175
24	265.00	168	168	11,472	26,768	38,240	†	...	15,930	31,870	47,800	15	....	0	360	470	27 x 34 x 31½	¼	1,150‡	22	4,320	1,080	250
30	340.00	245	245	15,200	35,200	50,400	†	...	21,000	42,000	63,000	18	....	0	470	600	33 x 37½ x 32	½	1,150‡	24	5,700	980	500

*Temperature of water used: 50° or over to hot. † Ammonia, Freon, brine, or water. ‡ All models variable, 4-speed motors.

Air Conditioning

Method of Selecting Equipment For Air Conditioning Based On Heat Transfer Data

BLOOMFIELD, N. J.—How the selection of air-conditioning equipment for a particular installation may be based upon the application of the principles of psychrometry, heat transfer, and air flow, is the subject of a study by F. H. Faust and F. O. Urban of the commercial engineering division, air-conditioning department, General Electric Co. These two engineers prepared the information for the instruction of G-E dealers.

Application requirements which affect the selection of air conditioning equipment, say Messrs. Faust and Urban, are based largely on the four elements of air conditioning; namely, temperature, humidity, air purity, and air motion.

Factors Determining Size

The size, or capacity, of the equipment is based on the heat and moisture gain or loss. These are dependent on the temperature and humidity maintained within the air conditioned space, the quantity of outside air introduced to provide air purity, the effects of sunshine, the number of people present and miscellaneous internal sources of heat.

The total quantity of air supplied, and the method of introducing it to the conditioned space, are selected to provide even temperature distribution and adequate air motion without the creation of unpleasant drafts. The design characteristics of the elements of the air-conditioning system, and method of control, are based on meeting the application requirements under varying conditions of operation, such as changes of weather conditions and of occupancy within the conditioned space.

Application Procedure

Steps in an application procedure are outlined by the G-E engineers as follows:

1. A careful survey of the proposed undertaking,
2. Calculation of the heating and cooling loads,
3. Selection of the type of system,
4. Selection of equipment.

The survey involves a collection of all the information necessary to determine the application requirements, the heating or cooling load, the best method of distributing the conditioned air and the best location and arrangement of the equipment. It thus requires a careful determination of the customer's requirements and constructional and architectural features of the premises. The collection of the necessary information may be expedited by a suitable form of sheet.

Cooling load calculations have been described previously, and may be obtained by going to one of any number of references. The engineers suggest the *A. S. H. V. E. Guide* and a previous study which they made. (Reported in Sept. 25, 1935, issue of Electric Refrigeration News.)

The selection of the type of system involves a consideration of numerous possibilities, such as a unit system, a central plant system, and various zoning arrangements.

A central plant air conditioner may be defined as an air conditioner which is installed at a location remote from the air conditioned space, and which requires ducts to distribute the conditioned air.

A room air conditioner may defined as an air conditioner suitable for installation directly within the air conditioned space.

The above definitions indicate that the essential difference between a central plant system and a unit system using room devices is in the location of the air conditioner and the methods of distributing air.

Other Differences

However, there are other differences. A unit system is usually made from factory-built assemblies. A central plant system is often designed or tailor-made for the job, or else made from factory-built assemblies which are sufficiently flexible in nature to permit essentially the equivalent of a special design. This means that the central plant air conditioner is more flexible in its field of application.

To a certain extent, say the engineers, the type of application proposed determines the type of system. For instance, large rooms with highly concentrated loads generally require central plant systems. The air must be distributed with great care and projected over wide areas. This can usually be accomplished best with duct distribution. Furthermore, such applications are generally more economical with a single air conditioner employing duct distribution than with a multiplicity of units.

In the other hand, spaces which are broken up into a number of small rooms may sometimes be handled by a unit system and sometimes by a central plant system. In an existing building a unit system may be required for lack of space to erect a duct system, or because duct work would interfere with the architectural treatment.

A single definite procedure which will directly determine the combination of equipment that best meets the two fundamental requirements of adequate performance and lowest cost is an inherent impossibility, because of the large number of variables involved, Messrs. Faust and Urban point out. As an example, a given capacity may be obtained with one combination of heat transfer surface and temperature of cooling medium, or with a greater amount of surface and a higher temperature of cooling medium. The former is more economical as regards cost of the cooling surface, but requires more expensive refrigerating equipment than the latter.

To illustrate further, the same capacity may be had at a fixed temperature of cooling medium with various combinations of cooling surface and air flow. The combination with the least volume of air flow requires the largest and most expensive cooling surface, but the smallest and least expensive fan and duct distribution system.

Another important matter, say the engineers, is the relation between quantity and temperature of air delivered from the air conditioner, and the method of introducing it to the conditioned space. For example, air may be introduced at a temperature of, say 15° F. or 30° F. below that in the room. The latter would necessitate half as much air as the former, but might not be so well adapted to satisfactory distribution.

As a rough criterion, if the rate of air supply is equivalent to a complete change in the conditioned space in form 4 to 10 min. it should be relatively simple to arrange the supply and return openings to provide satisfactory temperature distribution and air motion. If the rate of air supply is widely different from these limits, it may be necessary to take special precautions to provide adequate air motion, or to avoid drafts.

Items to Be Considered

Thus in selecting air-conditioning equipment it is necessary to consider carefully methods of introducing air to the conditioned space, relative costs of air conditioner, refrigeration equipment and air distribution system, as well as design characteristics of the equipment. Further discussion will be limited to selection of design characteristics to meet specified capacity requirements.

Dehumidification may be accomplished by passing air over a heat transfer surface, or through a spray of water, which is maintained at a temperature below the initial dew point of the air. The problem is to so select the surface and its temperature that dehumidification and sensible heat absorption will be in the right proportion to just offset the moisture and sensible heat gains. The relation between dehumidification and sensible heat capacities of a given surface may be determined from a purely psychrometric principle, as discussed by Urban in a previous study. (See May 29, 1935, issue of Electric Refrigeration News for chart and explanation.) The engineers elaborate on the use of the chart as follows:

Figure 1

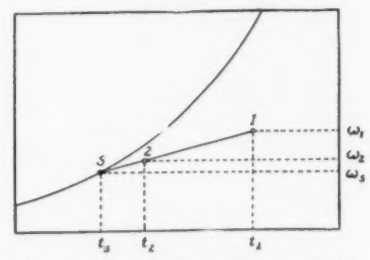


Fig. 1—Skeleton psychrometric chart, showing plotting points for entering air temperature, evaporator temperature, and leaving air temperature.

Fig. 1 is a skeleton psychrometric chart in which moisture content, or absolute humidity, of air forms the scale along the side, and dry bulb temperature the scale along the bottom. The curve represents the weight of water vapor associated with unit weight of dry air saturated. Suppose that air is introduced to a cooling surface at a temperature and humidity corresponding to a point, 1, and suppose that the temperature of the surface is t_s. If a point, S, is located on the saturation curve at

(*Continued on Page 15, Column 1*)

This 5 H.P. refrigeration unit operates on V-METH-L. Cools and dehumidifies this office building located at West Norfolk, Virginia—in one of the most humid areas of our coastline.

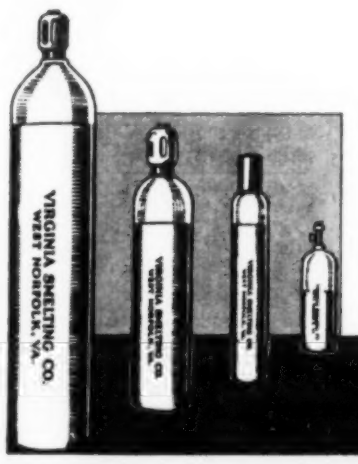
For restaurants, shops, and small office buildings

V-METH-L (Virginia methyl chloride) is an ideal refrigerant for moderate sized air conditioning jobs. Pleasant odor—non-corrosive to copper, brass, iron. Regularly used in flanged copper tube construction. Used with perfect safety up to 2½ lbs. per 1,000 cubic feet of space.

New use of brine in air conditioning

ESOTOO (liquid sulphur dioxide), made by the makers of V-METH-L, can be safely used for air conditioning even with a spray washer, provided an absorbent brine is used. Send for reprint of article describing such use.

Prompt Delivery from 69 Distributing Points



VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

THE most minutely accurate scientific testing and measuring instruments available today, are used in checking for fit and balance of every moving part in Copeland Commercial Units. These delicate operations are a regular part of the standard Copeland manufacturing process. By this unusual method, each unit achieves a built-in smoothness, long life and economy that is seldom equalled. Satisfy your customers by selling this great Copeland line. Write, today.

COPELAND REFRIGERATION CORPORATION
Manufacturers of a complete line of Household and Commercial Refrigeration
Holden Ave., at Lincoln - - - DETROIT, MICH.

Copeland COMMERCIAL REFRIGERATION

Copeland DEPENDABLE Electric REFRIGERATION

Buffalo Forge

Buffalo Forge Co.
Buffalo, N. Y.

Functions—Remote or suspended type and suspended type: cooling and dehumidifying. Duct type: heating, cooling, dehumidifying, humidifying, and cleaning.

Cabinet—Remote or suspended type: Buffalo Forge steel cabinet, paint finish, not insulated. Suspended type: Buffalo Forge cadmium-plated steel cabinet, not insulated. Duct type: Buffalo Forge steel cabinet, paint finish, insulation optional as specified.

Blower—Remote or suspended type: Buffalo Forge centrifugal fans. Make and type of motor optional, direct connected. Suspended type: Buffalo Forge disc fans. Blower drive: overhung wheel on motor shaft. Duct type: Buffalo Forge centrifugal fans, make and type of motor as specified. V-belt drive.

Air Circulation—Remote or suspended type: air intake in bottom, discharge in top in remote units; intake in back, discharge in front in suspended units, fresh air intake provided. Suspended type: air intake in back, discharge in front, louvre deflector discharge grilles. Duct type: air intake in back, discharge in front, fresh air intake provided.

Cooling System—Direct expansion or circulating cold water on all models. Aerofin copper cooling coils.

Heating System—Aerofin copper coils, may be used with hot water Heating capacities, model 121-PC 57,000 B.t.u.; 122-PC, 114,000; 123-PC 155,000; 151-PC, 114,000; 152-PC 228,000; 153-PC, 342,000; 182-PC 450,000; 212-PC, 684,000.

Type of Humidifier—Coil and pan

Air Cleaning Medium—Owens-Illinois glass filters.

Remote Floor or Suspended Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
254-FC	$.....	...	0	12,500	37,500	50,000	Freon or	...	12,500	37,500	50,000	30	2	0	...	825	47†	1	1,150	11½	3,240	...	..
258-FC	.....	.....	...	19,000	57,000	76,000	CH_3Cl or	...	19,000	57,000	76,000	35	3	0	...	950	47†	1	1,150	11½	2,850	...	...
354-FC	.....	.....	...	18,600	55,900	74,500	Water or	...	18,600	55,900	74,500	35	3	0	...	1,100	68†	1½	1,150	11½	4,860	...	...
358-FC	...	.....	...	20,600	40,000	60,600	Brine	..	28,500	85,500	114,000	40	4	0	...	1,250	68†	1½	1,150	11½	4,280	...	...
454-FC	...	.....	...	24,750	74,250	99,000		...	24,750	74,250	99,000	40	4	0	...	1,350	86†	2	1,150	11½	6,480	...	...
458-FC	...	.....	...	38,000	114,000	152,000		...	38,000	114,000	152,000	45	5	0	...	1,550	86†	2	1,150	11½	5,700	...	...
3154-FC	..	.....	...	35,000	105,000	140,000		...	35,000	105,000	140,000	55	2	0	...	1,700	86†	3	1,150	15	9,150	...	...
3158-FC	..	.....	...	54,000	161,000	215,000		...	54,000	161,000	215,000	60	4	0	...	2,000	86†	3	1,150	15	8,050	...	...
3554-FC	..	.....	...	49,500	149,000	198,500		...	49,500	149,000	198,500	75	2	0	...	2,100	86†	5	1,150	11½	12,960	...	...
3558-FC	..	.....	...	76,000	228,000	304,000		...	76,000	228,000	304,000	80	3	0	...	2,300	86†	5	1,150	11½	11,400	...	...

Suspended Type

413-SC	$.....	....	0	4,600	14,000	18,600	Freon or	..	4,600	14,000	18,600	4	¼	0	...	175	18 x 22½ x 16¾	1/20	1,750	12	700	...	..
417-SC	.....	....	0	6,400	18,800	25,200	CH_3Cl or	..	6,400	18,800	25,200	8	1	0	...	240	23¼ x 25½ x 19	1/20	1,150	16	880	...	..
419-SC	.....	....	0	11,300	33,900	45,200	Water or	..	11,300	33,900	45,200	12	3½	0	...	330	27 x 28½ x 19⅜	⅛	1,150	18	1,630	...	..
213-SC	.....	....	0	3,000	9,000	12,000	Brine	..	3,000	9,000	12,000	3	¼	0	...	125	18 x 22½ x 16¾	1/20	1,750	12	820	...	..
217-SC	.....	....	0	4,000	12,000	16,000		..	4,000	12,000	16,000	6	1	0	...	180	23¼ x 25½ x 19	1/20	1,150	16	1,040	...	..
219-SC	.....	....	0	7,300	22,000	29,300		..	7,300	22,000	29,300	9	3½	0	...	240	27 x 28½ x 19¾	⅛	1,150	18	1,915	...	..

Duct Type

121-PC	$.....	....	....	10,300	20,000	30,300	Freon or	..	10,300	20,000	30,300	18	.87	10	...	750	22 x 30 x 68	⅓	...	11½	800	...	..
122-PC	.....	....	....	20,600	40,000	60,600	CH_3Cl or	..	20,600	40,000	60,600	20	1.3	20	...	1,150	22 x 50 x 68	¾	...	11½	1,600	...	..
123-PC	.....	....	....	30,900	60,000	90,900	Water or	..	30,900	60,000	90,900	24	2.2	30	...	1,550	22 x 64 x 68	1	...	11½	2,400	...	..
151-PC	.....	....	....	20,600	40,000	60,600	Brine	..	20,600	40,000	60,600	28	.87	20	...	1,200	30½ x 36 x 73	¾	...	15	1,600	...	..
152-PC	.....	....	....	41,250	80,000	121,250		..	41,250	80,000	121,250	30	1.7	40	...	2,000	30½ x 64 x 73	1½	...	15	3,200	...	..
153-PC	.....	....	....	62,000	120,000	182,000		..	62,000	120,000	182,000	40	3.0	60	...	2,500	30½ x 84 x 73	2	...	15	4,800	...	..
182-PC	.....	....	....	82,500	160,000	242,500		..	82,500	160,000	242,500	60	3.5	80	...	3,200	42½ x 75 x 90	3	...	18	6,400	...	..
212-PC	.....	....	....	124,000	240,000	364,000		..	124,000	240,000	364,000	80	3.0	80	...	4,400	62 x 84 x 96½	5	...	21	9,600	...	..

*Temperature used: Five lbs. steam pressure. †Height and depth vary, depending on type.

McCord

McCord Radiator & Mfg. Co.
Detroit, Mich.

Functions—Models AC-300, AC-500, AC-700—cooling, dehumidifying, cleaning; all other models: heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet—McCord steel cabinet, insulated, with crinkle or walnut olive finish on AC-300, AC-500, AC-700 only, spray lacquer finish on all others.

Blower—Capacitor motor with V-belt drive on suspended or duct type.

Air Circulation—Air intake at back; air discharge at front. McCord double louvre on AC-300, AC-500, AC-700, and grille on all others. Fresh air intake provided.

Cooling System—Direct expansion and circulating cold water. McCord copper cooling coils.

Heating System—McCord copper heating coils. Heat capacity in B.t.u.'s per hour: model 101, 38,500; 102, 62,000; 122, 182,100; 132, 242,800; 152, 364,200; 182, 485,600.

Type of Humidifier—Steam and water spray.

Air Cleaning Medium—Glass and fiber filter.

Controls—All models: thermostatic expansion valve, liquid line solenoid valve; models 101, 102, 122, 132, 152, 182: humidistat, thermostat, air bypass dampers, and water-regulating valve.

Special Features—Variable speed drive and McCord Economizers on suspended or duct type. Double louvres optional on suspended type.

Suspended Type

Model No.	Price†	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT‡ Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
AC-300	$117.00	58	0	....	....	8,950	Any	...	.....	...	...	...	...	0	80	...	14½ x 19⅞ x 15⅞	...	...	..	460-300	300-450	...
AC-500	162.00	130	0	....	....	19,400	Any	...	.....	...	...	...	...	0	105	...	20½ x 24⅞ x 19⅜	...	...	..	800-675	...	...
AC-700	180.00	163	0	....	....	31,000	Any	...	.....	...	...	...	...	0	140	...	23½ x 27⅞ x 19½	...	...	..	1,200-800	...	...

Suspended or Duct Type

101	$261.00	130	65	....	19,000	29,000	Freon or	....	....	38,500	8	...	10	600	...	21⅞ x 27	x 68	¼	800	9¾	800	1,150	125
102	396.00	260	130	....	38,000	58,000	CH_3Cl or	....	....	62,000	16	...	20	1,060	...	21⅞ x 47	x 68	⅓	800	(2) 9¾	1,600	1,150	180
122	566.00	390	195	....	57,000	87,000	Water or	....	....	120,000	24	...	30	1,370	...	21⅞ x 61	x 68	½	650	(2) 11⅜	2,400	1,250	270
132	783.00	520	260	....	76,000	116,000	NH_3	....	....	150,000	32	...	40	1,410	...	29½ x 61	x 73	¾	610	(2) 13	3,200	1,250	390
152	931.00	780	390	....	114,000	175,000		....	....	170,000	35	...	60	1,770	...	29½ x 81	x 73	1	480	(2) 16¼	4,800	1,200	550
182	1,240.00	1,040	520	....	152,000	233,000		....	....	225,000	45	...	80	2,060	...	41½ x 81	x 89	1½	450	(2) 17⅞	6,400	1,280	750

*Temperature of water used: Various. †Price based on 2-row steam coils and 3-row Freon coils. ‡Ratings based on 2-row steam coils, 4-row Freon coils.

McQuay

McQuay, Inc., Minneapolis, Minn.

Functions—Models 106, 126, 156, 186, and 216: cooling and dehumidifying; all W models: heating, cooling, and dehumidifying.

Cabinets—McQuay insulated steel cabinet, crackle-enamel finish.

Air Circulation—Air intake in rear, discharge in front, no fresh air intake.

Cooling System—W models: circulating cold water; all others: direct expansion. McQuay tinned-copper cooling coils.

Heating System—McQuay tinned-copper coils, may be used with hot water. Heat capacities: model 106-W, 13,900 B.t.u.; 126-W, 22,000; 156-W, 34,000; 186-W, 64,000; 216-W, 81,500; 246-W, 115,000; and 276-W, 135,000.

Suspended Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
106	$126.00	49.58	0	....	....	11,400	...	....	....	....	....	...	....	0	59	77	.....	..	....	....	325	425	..
126	156.00	64.8	0	....	....	17,500	...	....	....	....	....	...	....	0	85	105	.....	..	....	....	515	515	..
156	187.00	101.0	0	....	....	28,700	...	....	....	....	....	...	....	0	113	136	.....	..	....	....	850	545	..
186	219.00	145.8	0	....	....	52,650	...	....	....	....	....	...	....	0	146	172	.....	..	....	....	1,800	800	..
216	258.00	198.29	0	....	....	68,800	...	....	....	....	....	...	....	0	179	215	.....	..	....	....	2,350	768	..
106-W	126.00	49.58	49.58	....	....	....	...	....	....	....	13,900	11	....	0	59	77	.....	..	....	....	325	425	..
126-W	156.00	64.8	64.8	....	....	....	...	....	....	....	22,000	12	....	0	85	105	.....	..	....	....	515	515	..
156-W	187.00	101.0	101.0	....	....	....	...	....	....	....	34,000	15	....	0	113	136	.....	..	....	....	850	545	..
186-W	219.00	145.8	145.8	....	....	....	...	....	....	....	64,000	18	....	0	146	172	.....	..	....	....	1,800	800	..
216-W	258.00	198.29	198.29	....	....	....	...	....	....	....	81,500	21.5	....	0	179	215	.....	..	....	....	2,350	768	..
246-W	335.00	259.2	259.2	....	....	....	...	....	....	....	115,000	24.5	....	0	263	333	.....	..	....	....	3,600	900	..
276-W	436.00	327.89	327.89	....	....	....	...	....	....	....	135,000	27.5	....	0	387	477	.....	..	....	....	4,100	810	..

Crosley

Crosley Radio Corp.
Cincinnati, Ohio.

Functions—Cooling and dehumidifying.

Cabinet—Crosley insulated steel cabinet with lacquer finish.

Compressor—Crosley single-cylinder, air-cooled compressor. Delco condenser-start motor.

Blower—Three-blade fan, steel and tube blower. Delco shaded-pole motor with direct drive.

Air Circulation—Air intake and air discharge under canopy. Fresh air intake provided.

Cooling System—Direct expansion.

McCord hot-tinned copper cooling coils.

Air Cleaning Medium—Provision made for oil-type filter in return air passage; glass wool recommended.

Self-Contained Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
.....	$ 99.50	...	0	....	....	800	F-12	½	1½ x 1¾	550	¼	280	0	0	204	224	32½ x 20¼ x 23	1/100	1,500	7½	75	...	20

Electrol

Electrol, Inc., Clifton, N. J.

Functions—Cooling, dehumidifying, and cleaning.

Cabinet—Insulated wood cabinet, walnut finish.

Compressor—Two-cylinder, water-cooled compressor. Delco capacitor motor. High side safety cutout.

Air Circulation—Air intake in rear; air discharge in front. No fresh air intake.

Self-Contained

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
RC-1	$.....	...	...	....	....	....	Freon	...	1⅛ x 1¼	650	½	...	0	0	...	280	34 x 36 x 18	...	...	...	520	470	...
RC-2	.....	...	...	....	....	....	Freon	...	1.64 x 1⅝	500	½	...	0	0	...	335	34 x 36 x 18	...	...	...	575	520	...

Psychrometric Chart Used in Determining Temperature Ratios

(Continued from Page 13, Column 5)

the temperature t_s, and this point joined to the entering point, 1, by a straight line, then some point, 2, located on this straight line, represents the condition of air leaving the surface.

The temperature at point 2 depends on the rate of flow of air, the area of the cooling surface, the sensible heat transfer coefficient of the surface and the entering-air and surface temperatures. The humidity at this point is then automatically fixed. The dry bulb temperature of the air leaving the surface cooler may be calculated from a simultaneous solution of the equations of heat transfer and conservation of energy:

$$H_s = A_s\ h_s\ (t_s - t_s)_m \quad (1)$$

$$H_s = 0.245\ M\ (t_1 - t_2) \quad (2)$$

The log-mean temperature difference is generally used:

$$(t_s - t_s)_m = \frac{t_1 - t_2}{2.3 \log_{10} \frac{t_1 - t_s}{t_2 - t_s}} \quad (3)$$

Substance of this principle is that when air is cooled by a surface having a temperature less than the initial dew point of the air, the dehumidification, expressed in heat units, is a definite percentage of the sensible heat reduction. The important thing to note is that this dehumidification ratio is determined from psychrometric principles, and is independent of the design of the cooling surface. The equation relating this ratio to the temperature and humidity of the entering air and the surface temperature is:

$$f = 0.62\ \frac{w_1 - w_s}{t_1 - t_s} \quad (4)$$

What Takes Place in System

Now consider what takes place in a cooling system. Air is returned from the conditioned space to the air conditioner through the return duct. This recirculated air may be mixed with a quantity of outside air before coming to the cooling surface. In the air conditioner heat and moisture are extracted at rates equal to the sensible and latent heat gains, respectively. This treated air, which is now cooler and dryer than the average, or design, indoor conditions, is finally distributed to the conditioned space.

Mixing of two quantities of air at different conditions may be represented on the psychrometric chart by a straight line joining the points representing the initial stated points. Select a point o to represent the condition of outside air, fixed by design outdoor dry and wet bulb temperatures. Select a point i to represent the condition of inside or recirculated, air, fixed by design indoor dry and wet bulb temperatures. The mixture is represented by point 1, which is so located that the distance from i to 1 bears a percentage relation to the distance from i to o, equal to the outside air supply expressed as a percentage of the total circulation. (See figure 2).

The mathematical expressions which locate point 1 are:

$$t_1 - t_i = \frac{M_o}{M}\ (t_o - t_i) \quad (5)$$

$$w_1 - w_i = \frac{M_o}{M}\ (w_o - w_i) \quad (6)$$

where

M_o=weight rate of outside air supply.

M=weight rate of total circulation (outside plus recirculated air).

The air is cooled and dehumidified in the air conditioner, leaving at point 2. The temperature reduction is just equal to that necessary to absorb an amount of heat equal to the sensible heat gain. Similarly, the reduction of absolute humidity corresponds to the latent heat gain. Thus,

$$t_1 - t_2 = \frac{H_s}{0.245M} \quad (7)$$

$$w_1 - w_2 = 7000\ \frac{H_l}{1060M} \quad (8)$$

The specific volume of air at 80° F. and 50% relative humidity is 13.83 ft.³/lb. (from psychrometric chart). Hence, equations (7) and (8) may be written in a more convenient form, which is sufficiently accurate for calculations in all ordinary comfort applications:

$$t_1 - t_2 = \frac{H_s}{1.06Q} \quad (7a)$$

$$w_1 - w_2 = \frac{H_l}{0.66Q} \quad (8a)$$

To summarize what happens to air in a summer air conditioning system, refer to Fig. 2.

Air at conditions represented by point 1 is cooled and dehumidified to 2, where it enters the duct system. In the duct system heat may be picked up, warming the air to 3. The length of the line from 2 to 3 is proportional to the heat gain to the duct system. The air is introduced to the conditioned space at a temperature and humidity represented by 3. Here the air absorbs heat and moisture until its condition is represented by i.

The length of the line from 3 to 4 is proportional to the sensible heat gain of the room (exclusive of the heat gain of outdoor air supplied mechanically and mixed with the return air).

The length of the line from 4 to i is proportional to the latent heat gain of the room (exclusive of mechanical outdoor air supply). Air is removed from the room at condition i and mixed with outdoor air, thereby increasing its moisture content and temperature to the condition represented by 1. The length of the line from i to 5 is proportional to the sensible heat gain of the outdoor air supply, and the line from 5 to 1 is proportional to the latent heat gain of the outdoor air supply.

The above discussion has said nothing about how the air is to be brought to the condition 2. As described earlier, this may often be accomplished by passing the air over a surface having the right temperature. This temperature is determined by extending the straight line joining points 1 and 2, until it intersects the saturation curve at S, Fig. 1. However, the extension of this straight line may fail to intersect the saturation curve. This case will be discussed later.

If an intersection with the saturation curve is obtained, it is possible to determine the required size of cooling surface directly from the sensible heat load. Thus, from (1)

$$A_s = \frac{H_s}{h_s\ (t_o - t_s)_m} \quad (9)$$

Figure 2

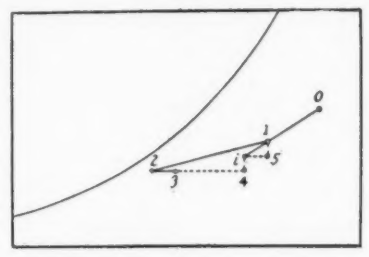


Fig. 2—Summary of air paths in a comfort cooling application.

Refrigeration equipment is selected on the basis of the total cooling load and the required cooling-medium temperature. The latter depends on the total cooling load and the coefficient of heat transfer from surface to cooling medium, as given by the following relation:

$$(t_s - t_r)_m = \frac{H_t}{h_r\ A_r} \quad (10)$$

Judgement must be exercised in selecting an economical combination of heat transfer surface and refrigeration equipment. From equation (9) it may be seen that the greater the mean temperature difference from air to cooling surface, the less surface will be required. Referring to Fig. 1, for fixed entering air and surface temperatures the mean temperature difference may be increased by increasing t_2.

But an increase of t_2 is permissible only by increasing the total air flow (see equation 7). This is equivalent to saying that a given amount of heat may be removed from a large quantity of air with less heat transfer surface than is required with a smaller flow of air. Thus, the first point to consider is an economic balance between air quantity and heat transfer surface, together with a careful consideration of the effect of air temperature and quantity on the method of introducing it to the conditioned space.

Selection of Design Conditions

In comfort applications, the second point to consider is a careful selection of design indoor conditions. A slight modification in the design indoor humidity will sometimes effect an appreciable saving in cost of equipment. This factor is of especial importance in view of the fact that the comfort zone mentioned above, extends over a range of relative humidities.

For example, consider an application in which there is but little latent heat gain. The line from 1 to 2 would be nearly horizontal, and the required surface temperature might be so high as to require a very large cooling surface. A slight reduction in the design indoor humidity will reduce the surface temperature, and by thus increasing the mean temperature difference permit the use of less surface.

Since refrigeration equipment capacity varies in steps corresponding to motor sizes, this simple expedient sometimes materially reduces the first cost of equipment. Admittedly, it increases operating cost somewhat, but to offset this there is the advantage of lower indoor humidity and the attendant improvement in conditions of comfort and control of odors.

Going the other way, a slight increase in the design indoor humidity may require a more expensive air conditioner but less expensive refrigeration equipment, at the same time resulting in a lower operating cost but less desirable conditions of humidity.

Variations in design indoor dry bulb temperature affect the selection of equipment in a manner similar to variations in design indoor humidity, but to a different degree.

Economic selection of equipment thus requires a balance between operating expense and fixed charges. Although the total cost of an air conditioning system may be reduced by slight variations in the design indoor conditions, these are beyond the control of the application engineer in industrial and process applications, and often in comfort applications. He must then confine his efforts to variations in air flow and characteristics of heat transfer surface in arriving at the most economical arrangement.

The straight line joining the state points of the air entering the air conditioner and that leaving it may fail to intersect the saturation curve. This indicates that the ratio of latent to sensible heat loads is so great as to require at least two treating devices in the air conditioner. The important thing to note here is that both spray type and surface type equipment have definite limitations as regards dehumidification.

Once the entering air point is fixed, the maximum ratio of latent to sensible capacity attainable with either type of equipment is fixed by the steepest line which may be drawn through this initial point and yet terminated on the saturation curve. This is the tangent to the saturation curve.

Thus, with the entering-air point fixed, no changes in the design of the surface cooler or spray chamber and no modifications of the air flow, such as by-passing, etc., will further increase the amount of dehumidification with respect to the sensible cooling.

The only alternative is to supplement the surface cooler or spray chamber by some device which will alter the temperature or humidity of the air. One method is to reheat the air after it has been cooled and dehumidified. Another method is to dehumidify the air chemically before

(Continued on Page 17, Column 1)

Explanation of Symbols Used in Formulae

The symbols and constants used in this discussion are defined as follows:

Dry bulb temperature, °F.

$(t_s - t_s)_m$=mean temperature difference between air and heat transfer surface, °F.

$(t_s - t_r)_m$=mean temperature difference between heat transfer surface and cooling medium, °F.

w=water vapor content of moist air, grains of water vapor per lb. of dry air.

h_s=sensible coefficient of heat transfer between air and heat transfer surface, B.t.u./hr. ft.² °F.

h_r=coefficient of heat transfer between heat transfer surface and cooling medium, B.t.u./hr. ft.² °F.

A_s=area of heat transfer surface exposed to air, ft.²

A_r=area of heat transfer surface exposed to cooling medium, ft.²

M=weight rate of flow of air, lb. of dry air per hour.

Q=volume rate of flow of air ft.³/min. (c.f.m.).

H_s=sensible heat capacity or load, B.t.u./hr.

H_l=latent heat capacity or load, B.t.u./hr.

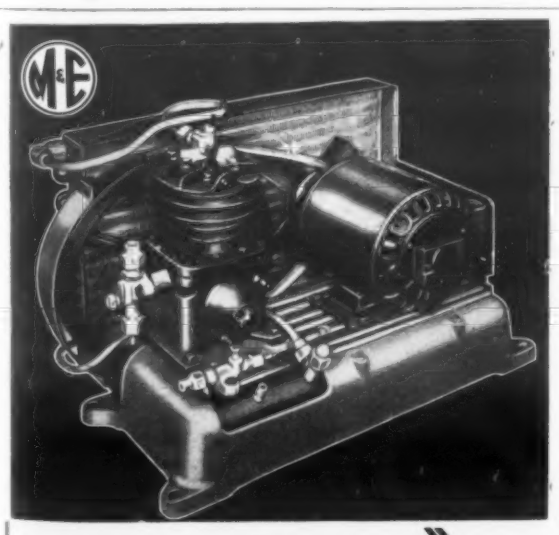
$H_t = H_s + H_l$=total heat capacity or load, B.t.u./hr.

$f = H_l/H_s$=ratio of latent to sensible heat capacity of heat transfer surface.

0.245=mean specific heat of moist air over range of conditions encountered in comfort applications, B.t.u./lb. of dry air/°F.

1060=mean latent heat of water vapor over range of conditions encountered in comfort applications, B.t.u./lb.

7000=factor used to multiply weight in lb. to obtain weight, gr.



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- Complete to Meet Every Need

The COROZONE AIR CONDITIONING CORPORATION
1422 EUCLID AVENUE
CLEVELAND, OHIO

Carbondale

Carbondale Machine Corp.
Harrison, N. J.

Functions — Self-contained type: cooling and dehumidifying. Suspended or duct and duct types: heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet—Self-contained type: Carbondale steel cabinet, crackled walnut finish, not insulated. Suspended or duct and duct types: Carbondale insulated steel cabinet, paint finish.

Compressor — Self-contained type: Carbondale water-cooled compressor, two cylinders on RH-1, four cylinders on RH-2. High side safety cutout. Automatic dual pressure type compressor control. Suspended or duct and duct types: Carbondale water-cooled compressor; four cylinders on models 1-DV, 2-DV, 1-DH, and 2-DH; eight cylinders on 4-DV and 4DH; two units of four cylinders each on 3-DV, 5-DV, 3-DH, and 5-DH. High side safety cutout. Pressurestat and thermostat compressor control.

Blower—Self-contained type: propeller-type blower. Direct drive. Suspended or duct type: propeller-type blower. Worthington multi-V drive. Duct type: Forward-curve blade, centrifugal-type blower. Worthington multi-V drive.

Air Circulation—Self-contained type: air intake in rear, discharge in front. No fresh air intake. Special diffuser grilles, adjustable horizontally and vertically. Suspended or duct type: air intake in rear, discharge in front. Fresh air intake provided. Duct type: air intake in side at bottom, discharge in side or top. Fresh air intake provided.

Cooling System—Direct expansion and circulating cold water. Aerofin copper finned coils.

Heating System—Aerofin copper finned coils, can be used with hot water.

Type of Humidifier—Spray.

Air Cleaning Medium—American Air filters.

Controls—Self-contained type: thermostat, liquid line solenoid valve, and water-regulating valve. Suspended or duct type and duct type: thermostatic expansion valve, humidistat, thermostat, liquid line solenoid valve, air by-pass dampers, and water-regulating valve.

Self-Contained Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
RH-1	$.....	...	0	....	....	....	Freon or	...	3¼ x 2¼	475	2	...	0	0	80	...	18 x 18 x 16	1/16	870	...	850	500	..
RH-2	.....	...	0	....	....	....	CH_3Cl	...	3½ x 2¼	325	3	...	0	0	130	...	22 x 22 x 20	⅛	870	...	1,500	400	..
Suspended or Duct Type																							
1-DH	.....	...	...	....	....	....	Freon or	...	3¼ x 2¼	525	5	...	...	...	...	1,600†	30 x 57 x 68	½	833-1,185	12	1,040-1,900	500	..
2-DH	.....	...	...	....	....	....	CH_3Cl	...	4¼ x 3	450	10	...	...	...	...	2,000†	37¼ x 65 x 79¾	1	664- 975	15	2,200-4,020	500	..
3-DH	.....	...	...	....	....	....		...	4¼ x 3	450	(2) 10	...	...	...	...	2,400†	48 x 74 x 95½	2	593- 850	18	3,850-7,080	500	..
4-DH	.....	...	...	....	....	....		...	4¼ x 3	550	25	...	...	...	...	3,000†	48 x 106½ x 95½	3	465- 668	18	5,150-9,450	500	..
5-DH	.....	...	...	....	....	....		...	4¼ x 3	550	(2) 15	...	...	...	...	3,300†	48 x 106½ x 95½	5	485- 634	18	6,000-11,000	500	..
Duct Type																							
1-DV	.....	...	...	....	....	....	Freon or	...	3¼ x 2¼	525	5	...	...	...	...	1,550†	83½ x 45¼ x 32	½	833-1,185	12	1,040-1,900	500	..
2-DV	.....	...	...	....	....	....	CH_3Cl	...	4¼ x 3	450	10	...	...	...	...	1,950†	92¼ x 57¼ x 42¼	1	664- 975	15	2,200-4,020	500	..
3-DV	.....	...	...	....	....	....		...	4¼ x 3	450	(2) 10	...	...	...	...	2,300†	99½ x 68 x 62	2	593- 850	18	3,850-7,080	500	..
4-DV	.....	...	...	....	....	....		...	4¼ x 3	550	25	...	...	...	...	2,900†	99½ x 100½ x 66½	3	465- 668	18	5,150-9,450	500	..
5-DV	.....	...	...	....	....	....		...	4¼ x 3	550	(2) 15	...	...	...	...	3,200†	99½ x 100½ x 66½	5	485- 634	18	6,000-11,000	500	..

*Water temperature variable. †Gross weight without compressor and condensing unit.

Miller

Miller Conditionair, Inc.
Los Angeles, Calif.

Functions — Remote floor type: models C-K and D-K, cooling, humidifying, dehumidifying, and cleaning; all others, heating, cooling, humidifying, dehumidifying, and cleaning. Suspended type: heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet—Miller steel cabinet, walnut finish.

Blower—Direct drive.

Cooling System—Models C-W and D-W: circulating cold water; all others: direct expansion. Copper cooling coils.

Heating System—Copper coils, may be used with hot water.

Type of Humidifier—Spray.

Air Cleaning Medium—Cartridge filter.

Controls — Water-regulating valve and automatic expansion valve.

Special Features—Medicinal inhalant cup.

Remote Floor Type

†Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
C-S	$.....	...	...	....	....	....	Freon	...	....	....	....	....	...	...	190	221	39⅛ x 22¼ x 16¼	1/40	900	..	...	...	...
D-S	.....	...	...	....	....	....	Freon	...	....	....	....	....	...	...	190	221	34⅞ x 22¼ x 16¼	1/40	900	..	...	...	...
C-K	.....	...	0	....	....	....	Freon	...	....	....	....	....	...	...	190	221	39⅛ x 22¼ x 16¼	1/40	900	..	...	...	...
D-K	.....	...	0	....	....	....	Freon	...	....	....	....	....	...	...	190	221	34⅞ x 22¼ x 16¼	1/40	900	..	...	...	...
C-W	.....	...	...	....	....	....	Freon	...	....	....	....	....	...	...	190	221	39⅛ x 22¼ x 16¼	1/40	900	..	...	...	...
D-W	.....	...	...	....	....	....	Freon	...	....	....	....	....	...	...	190	221	34⅞ x 22¼ x 16¼	1/40	900	..	...	...	...

†Miller also manufactures a suspended-type unit, model BG-S, on which no tabular information was supplied.

Sturtevant

B. F. Sturtevant Co.
Hyde Park, Boston, Mass.

Functions—Heating, cooling, humidifying, dehumidifying, and cleaning.

Cabinet—Sturtevant steel cabinet, paint finish. Not insulated.

Blower—Sturtevant blower, V-belt drive.

Air Circulation—Air intake, front and rear; air discharge, top and front. Fresh air intake provided.

Cooling System—Direct expansion and circulating cold water. Sturtevant copper coils.

Heating System—Sturtevant copper coils. Can use coils with hot water.

Type of Humidifier—Spray.

Air Cleaning Medium—Filter type, make optional.

Controls—Air by-pass dampers.

Duct Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
1000	$.....	...	...	....	....	39,000	...	...	....	....	39,000	7.82	1.5	...	...	...	.....	...	...	..	1,000	...	...
2000	.....	...	...	....	....	78,000	...	...	....	....	78,000	15.64	3.2	...	...	...	.....	...	...	..	2,000	...	...
3000	.....	...	...	....	....	117,000	...	...	....	....	117,000	23.46	5.0	...	...	...	.....	...	...	..	3,000	...	...
4000	.....	...	...	....	....	156,000	...	...	....	....	156,000	31.28	5.0	...	...	...	.....	...	...	..	4,000	...	...
5000	.....	...	...	....	....	195,000	...	...	....	....	195,000	39.10	6.0	...	...	...	.....	...	...	..	5,000	...	...
6000	.....	...	...	....	....	234,000	...	...	....	....	234,000	46.92	6.0	...	...	...	.....	...	...	..	6,000	...	...
8000	.....	...	...	....	....	312,000	...	...	....	....	312,000	62.56	8.0	...	...	...	.....	...	...	..	8,000	...	...
10000	.....	...	...	....	....	390,000	...	...	....	....	390,000	78.20	8.0	...	...	...	.....	...	...	..	10,000	...	...

De La Vergne

DeLaVergne Engine Co.
Philadelphia, Pa.

Functions—Cooling, dehumidifying, and cleaning; heating and humidifying optional.

Cabinet—DeLaVergne insulated natural wood cabinet on models AA-1 and AA-1.5; DeLaVergne insulated steel cabinet, finish as desired, on model 101-S.

Compressor—DeLaVergne two-cylinder, air-cooled compressor. Electric compressor control.

Blower—Multivane blower. Direct drive.

Air Circulation—Air intake in right side. Air discharge in top. Fresh air intake provided. Special DeLaVergne discharge grille.

Cooling System—Direct expansion. Special DeLaVergne copper cooling coils.

Heating System—Special DeLaVergne copper heating coils. Coils cannot be used with hot water.

Air Cleaning Medium—Filter on models AA-1 and AA-1.5; Arco filter on model 101-S.

Self Contained

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
AA-1	$.....	250	250	....	....	12,000	Freon	6	1¾ x 1 1/16	1,750	1½	2,000	...	...	1,200	1,300	49 x 52 x 22	⅛	1,150	11 & 9½	400	300	500
AA-1.5	.....	250	250	....	....	18,000	Freon	6	1¾ x 1½	1,750	2	2,500	...	...	1,200	1,300	49 x 58 x 22	½	1,750	11 & 9½	600	300	800
101-S	.....	200	250	....	....	14,000	Freon	6	1¾ x 1 1/16	1,750	1½	1,700	...	...	750	800	39 x 47 x 17	¼	1,150	9½	425	300	500

Williams

Williams Oil-O-Matic Heating Corp.
Bloomington, Ill.

Functions—Cooling, dehumidifying, heating, humidifying, and cleaning. (Oil-O-Matic burners ranging in capacity from 1½ to 25 gallons of oil per hour are offered to meet the heating requirements for any Air-O-Matic installation.)

Cabinet—Metal housing for air distribution unit.

Blower—Single inlet type, with the drive and motor outside the air current, but within the housing.

Air Circulation—For installations up to 9 tons, the factory furnishes an air distribution unit complete with air filter, cooling coil, heating coils, fan assembly, and humidifier. On installations of larger capacity, the housing and frame of the air distribution unit should be constructed on the job. Air inlet and discharge at the top.

Cooling System—All models employ an absorption unit consisting of a condenser, an absorber, solution pump, heater, and heat exchanger. Both heating and cooling coils are tin-dipped, copper-finned. Heat input to burner in B.t.u. per hour—model 6, 103,170; model 9, 153,850; model 13, 231,680; model 20, 343,900.

Type of Humidifier—Either the spray or pan type. Tap water supply to either type is automatically controlled.

Air Cleaning Medium—Conventional type filter.

Controls—Selector switch with five positions: (1) off; (2) heating; (3) ventilation; (4) refrigeration; (5) off. Thermostatic expansion valve, cooling thermostat, dual heating thermostat, damper controller, and humidistat.

†Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
6	$.....	....	....	....	....	68,400†	Zeon	...	.....	...	¾	570	...	...	...	...	55 x 46 x 46	...	...	..	...	...	..
9	.....	....	....	....	....	102,000†	Zeon	...	.....	...	1	850	...	...	...	...	.....	...	...	..	...	...	..
13	.....	....	....	....	....	153,600†	Zeon	...	.....	...	1½	1,280	...	...	...	...	.....	...	...	..	...	...	..
20	.....	....	....	....	....	218,000†	Zeon	...	.....	...	2	1,900	...	...	...	...	70 x 46 x 50	...	...	..	...	...	..

††The Williams Air-O-Matic cools the air by an absorption refrigeration system. Ratings are on a basis of a saturated refrigerant temperature of 40° F., a steam temperature in the heating coil of 240° F. (10 lbs. pressure), an inlet cooling water temperature of 85° F., and an outlet cooling water temperature of 95° F.

Nelson

Herman Nelson Corp., Moline, Ill.

Functions—Cooling and dehumidifying.

Cabinet—Nelson insulated steel cabinet, lacquer finish.

Compressor—Nelson rotary compressor, water cooled. Capacitor motor. High side safety cutout.

Blower—Nelson centrifugal blower with direct-connected capacitor motor.

Air Circulation—Air intake in back; air discharge in top. Nelson grille. No fresh air intake.

Cooling system—Direct expansion only. Nelson copper coils.

Controls — Thermostatic expansion valve, thermostat, and water-regulating valve.

Self-Contained

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
G-750	$.....	70.4	0	2,250	5,750	8,000	Freon	8	Rotary	1,750	¾	780	0	0	300	385	31⅜ x 29⅜ x 15⅜	1/10	750	6	350	1,050	37

Selecting Equipment For Comfort Cooling

(*Continued from Page 15, Column 5*)

passing it to the surface cooler or spray chamber.

Reheat is commonly used when the ratio of latent to sensible heat loads is greater than can be handled simultaneously in a single process. The air may be cooled by a surface maintained at some temperature which is below the dew point corresponding to 2, to some point where the correct amount of moisture has been removed. In doing this, more than the required amount of sensible heat is removed. If the air were introduced to the conditioned space without further treatment, the temperature maintained would be lower than the design value. To avoid this, the air must be reheated in the air conditioner.

Effect of Reheat on Capacity

It may be seen that when reheat is required the refrigeration capacity must be greater than the total heat gain by the amount of reheat. To offset this item of operating cost, the cooling medium temperature should be as high as practicable so as to get the most refrigeration for the expenditure of a given amount of energy.

On the other hand, increasing the cooling-medium temperature raises the surface temperature. This increases the amount of reheat necessary. Hence, for a given application there may be a point beyond which the increased refrigeration capacity resulting from further raising the cooling medium temperature will be offset by the additional reheat required. Another feature to look out for is that as the cooling medium temperature is increased either more surface or more air must be used to get the required capacity.

The converse to the problem which the engineers have treated above is likewise important. That is, given an air-conditioning system which has certain characteristics under definite conditions of operation, what will be its characteristics under different conditions of operation, such as changes of heat gain, changes in the ratio of latent to sensible heat gains, etc.? The answers to these questions depend upon the characteristics of the particular equipment involved. However, it is possible to state in a general way what may be expected.

Variations in Equipment

Variations in characteristics of a given combination of equipment are illustrated in Figs. 3 and 4. These figures refer to particular designs of condensing unit and direct expansion evaporator, but they serve to illustrate qualitatively what will happen in any direct expansion system with fixed air flow as the conditions of operation change. It is supposed here that the system is designed for a specified capacity with 40° F. refrigerant and air entering the cooling surface at 85° F. dry bulb 70° F. wet bulb temperatures.

Capacities of the condensing unit for a fixed head pressure at various saturated suction refrigerant temperatures, and of the cooling surface for different wet bulb temperatures of the entering air and various refrigerant temperatures are shown in Fig. 3, These capacities are expressed as percentages of the value with 40° F. refrigerant and 70° F. wet bulb temperatures. The points of intersection give the resultant capacities of the combination.

It may be seen that whereas the capacity of the surface at a fixed refrigerant temperature increases approximately 4½% per degree increase of wet bulb temperature, the capacity of the *system* (condensing unit and evaporator) increases slightly less than 2% per degree increase of wet bulb temperature. This results from the increased operating refrigerant temperature with increased wet bulb temperature.

The ratio of latent to total heat capacity, expressed as a percentage of the value with 85° F. dry bulb and 70° F. wet bulb entering air are shown in Fig. 4. The solid lines are lines of constant wet bulb temperature, the dashed line is a line of constant absolute humidity of entering air and the dotted line is a line of constant relative humidity. It may be seen that when the entering wet bulb temperature increases without change of dry bulb temperature there is a material increase in the percentage of the total capacity which is expanded for dehumidification (in this case about 10% per degree change of wet bulb). A similar relation exists for increases of wet bulb temperature at constant relative humidity, but the percentage variation is much less, as shown by the dotted line.

Increased Wet Bulb

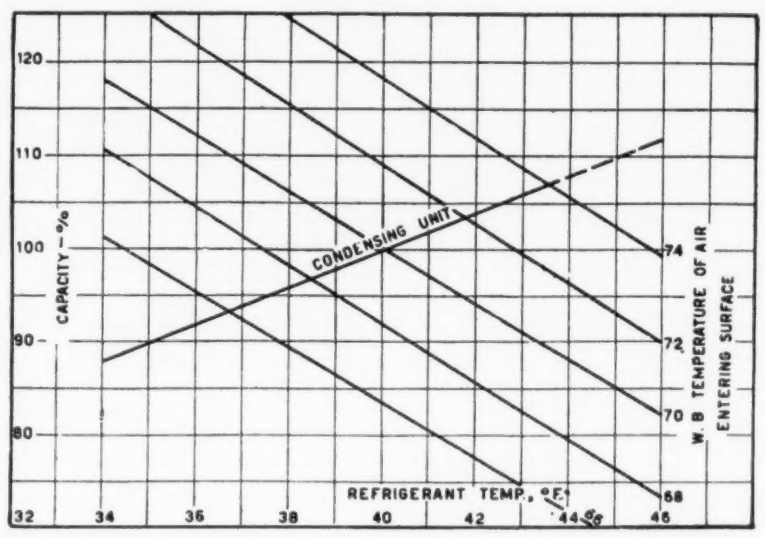
On the other hand, an increase of wet bulb temperature of the entering air with no change of dew point results in a decrease of the ratio of latent capacity to the total, as shown by the dashed line.

Now suppose an application for which the design conditions are such that the mixture of outdoor and recirculated air entering the air conditioner is at 85° F. dry bulb and 70° F. wet bulb. Suppose that the system whose characteristics are illustrated by Figs. 3 and 4 is exactly suited to design conditions of this application. What will happen when the outdoor conditions change so that the air entering the cooling surface is 80° F. dry bulb and 70° F. wet bulb (assuming no change of indoor conditions).

The total capacity of the equipment, Fig. 3, remains constant, but the dehumidification capacity increases 32%.

(Follow along the 70° F. wet bulb line of Fig. 4 from 85° F. to 80° F. dry bulb, and read 1.32). The sensible capacity must decrease, but it is necessary to know more to determine the percentage amount; namely, the ratio of latent to total capacity under design conditions. However, it can be seen qualitatively that a change of outdoor conditions which results in a decrease in sensible heat gain and and an increase in latent heat gain also results in a decrease in the sensible capacity of the equipment and an increase in the latent capacity.

Figure 3



Variation in capacities of cooling equipment as percentages of design value at 40° F. refrigerant temperature and 70° F. entering wet bulb.

Now suppose that with outdoor temperatures at design values the number of people in the conditioned space suddenly decreases, causing the latent heat gain to become a lesser percentage of the total. In the first place, the equipment will run intermittently, because its total capacity is greater than required. Furthermore, since it dehumidifies more than is necessary, the indoor humidity will decrease. This will reduce the humidity of the air entering the cooling surface, and reduce the latent capacity of the latter (Fig. 9).

But a decrease in indoor humidity increases the latent heat gain. The reduction in indoor humidity will continue until the ratio of latent to total heat gains is equal to the ratio of latent to total capacities of the equipment. Since a change of indoor humidity changes the heat gain of the space in a direction opposite to that of the latent capacity of the equipment, the net effect may be only a few per cent on the relative humidity which is maintained.

Problem on Selection

Messrs. Faust and Urban provide a numerical example to illustrate the principles involved in selecting equipment for cooling and dehumidifying described above. The numerical data given are:

Design outdoor dry bulb temperature, 95° F.

Design outdoor wet bulb temperature, 78° F.

Design indoor dry bulb temperature, 80° F.

Design indoor relative humidity, 50%.

Outdoor air supply (equivalent volume at 80° F. and 50% relative humidity), 1340 ft.³/min.

Total sensible heat gain, 87,000 B.t.u. per hour.

Total latent heat gain, 48,300 B.t.u. per hour.

Ratio of latent to sensible heat gains, 0.56.

Total air circulation (approximate), 4,000 ft.³/min.

The absolute humidities at design outdoor and indoor conditions are determined from the psychrometric chart:

$w_o = 117$ gr./lb.

$w_i = 77$ gr./lb.

The conditions of air entering the cooling surface (point 1 in. Fig. 2) are determined from equations (5) and (6):

$$t_1 = 80 + \frac{1340}{4000}(95-80) = 85° \text{ F.}$$

$$w_1 = 77 + \frac{1340}{4000}(117-77) = 90.4 \text{ gr./lb.}$$

This corresponds to a wet bulb temperature of 70.8° F. (Note that since outdoor air supply is specified in terms of the equivalent volume at design indoor conditions, it is unnecessary to convert to weight rates of flow.)

Rating tables for the cooling surface, giving latent and sensible heat capacities for various dry bulb and wet bulb temperatures, refrigerant temperatures and rates of air flow may be used if they are available. It is merely necessary to select a surface which has a 56% ratio between latent and sensible heat capacities when extracting 135,300 B.t.u./hr. (total heat gain) from approximately 4,000 ft.³/min. of air initially at 85° F. dry bulb and 70.8° F. wet bulb. Such rating tables are very convenient, and may be constructed by application of the fundamental principles described in this paper.

It will be supposed, for purposes of illustration, that rating tables are not available, but that a surface with the following characteristics is to be used:

Face area ..... 2 ft.² (and multiples.)

Ratio of outside surface to face area 38.4

Ratio of outside to inside surface 9.9

Heat transfer coefficient, refrigerant side ..... $h_r = 200$

Heat transfer coefficient, air side, given in table below:

Face velocity ft./min.	*Coefficient of sensible heat transfer, air to surface* h_s *B.t.u./hr. ft.² °F.*
350	5.9
400	6.4
450	6.8
500	7.2
550	7.6
600	7.9

The required temperature and hu-

(*Concluded on Page 19, Column 1*)

Type WRB-WRBP Water Regulators. The original ELECTRIMATIC pilot operated modulating valve. These regulators are over-size in capacity and construction.

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Electrimatic

CONSTANT IMPROVEMENT by WAGNER has resulted in

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WAGNER has furnished motors for air conditioning equipment for many years and has continuously improved motors for this purpose. Among the outstanding features of Wagner motors are: *(1)* QUIET OPERATION, *(2)* special operating characteristics to meet this exacting service, *(3)* long life, and *(4)* attractive appearance. As a result of Wagner's many years of experience in building motors for air conditioning equipment, Wagner motors are leaders in this field.

A few of the points of superiority of Wagner squirrel-cage motors are:

1. Rotor is of the cast-aluminum type, with bars, end-rings and blowers cast integrally, effecting a one-piece rotor exceptionally sturdy and long-lived. Skewed closed rotor slots minimize magnetic pulsations across the air gap and produce uniform starting torque at different positions of the rotor.

2. The frame and end-plates are strong and rigid, and accurately machined—assuring permanent alignment of bearings and uniform air gap, two essentials for quiet operation.

3. Blowers furnished on both ends of the rotor and many large openings in the stator frame insure thoro and unrestricted ventilation.

4. Stator windings are given a superior winding treatment which provides an insulating surface that is oil and moisture resisting and can be easily cleaned.

5. Stator and rotor laminations are punched from annealed, non-aging, high-grade electric sheet-steel selected for its magnetic properties.

Many other features of Wagner motors are worth investigating. Write today for Bulletin 174 which describes the Wagner motors that are Second-to-None for air conditioning.

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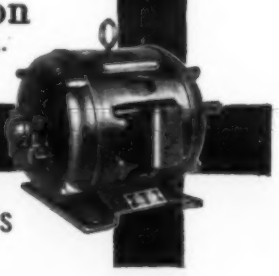
ML236-3M



MOTORS • TRANSFORMERS • FANS • BRAKES

Kauffman

Kauffman Air Conditioning Corp.
St. Louis, Mo.

Functions — Self-contained type: cooling, dehumidifying, and cleaning. Remote floor type: heating, cooling, humidifying, dehumidifying, and cleaning. Suspended type: cooling and dehumidifying. Suspended or duct type, and duct type: heating, cooling, humidifying, dehumidifying, and heating.

Cabinets — Self-contained, remote floor, and suspended types: Kauffman insulated steel cabinet, walnut finish. Suspended or duct and duct types: insulated steel cabinet, brown finish.

Compressor—Self-contained type: Kauffman two-cylinder compressor, air cooled in Model A, water cooled in models F, I, K, and L. Baldor motor, Cutler Hammer motor starter. Detroit high side safety cut out.

Blower—Self-contained type: models A, F, and I, Kauffman multiblade blower; models K and L, disc-type blower. Baldor motor. Belt drive on Model A. Direct drive on other models. Remote floor type: Kauffman multiblade blower. Direct drive. Suspended type: Torrington blower. Baldor motor. Direct drive. Suspended or duct type: Kauffman multiblade blower. Baldor motor. Belt drive.

Air Circulation—Self-contained type: air intake in rear, discharge in top. Fresh air intake on model A only. Kauffman directional grille. Remote floor type: air intake in bottom, discharge in top. Fresh air intake optional. Kauffman discharge grille. Suspended type: air intake in rear, discharge in front. Kauffman discharge grille. Suspended or duct type: air intake in rear, discharge in front. Fresh air intake provided. Kauffman directional discharge grille. Duct type: air intake in bottom, discharge in top, fresh air intake provided. Kauffman discharge grille.

Cooling System—Self-contained type: direct expansion. Kauffman copper cooling coils. All other types: direct expansion or circulating cold water. Kauffman copper cooling coils.

Heating System—Kauffman copper coils, can be used with hot water. Heating capacities: model G, 38,000; H, 47,000; M, 63,000; N, 120,000; O, 124,000; P, 162,000; 62H, 66,000; 75-H, 104,000; 76H, 140,000; 92H, 208,000; 93H 312,000; 94H, 388,000; 122H, 388,000 62V, 66,000; 75V, 104,000; 76V, 140,000 92V, 208,000; 93V, 312,000; 94V, 388,000 122V, 388,000.

Type of Humidifier—Spray.

Air Cleaning Medium—Kauffman filter.

Controls—Self-contained type; automatic expansion valve. Remote floor type: Detroit Lubricator thermostatic expansion valve, and humidistat. Suspended or duct type and duct type: thermostatic expansion valve, humidistat, and thermostat.

Self-Contained Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts†	Heat Capac. B.t.u.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
A	$400.00	45	0	5,600	3,000	8,600	Freon	4	1⅝ x 1⅝	425	¾	750	0	0	360	435	38 x 33 x 16	..	750	9	275	250	‡
F	400.00	35	0	4,100	2,700	6,800	Freon	4	1⅝ x 1⅝	425	¾	750	0	0	375	450	38 x 30 x 15	1/20	1,140	(2) 4½	275	250	‡
I	550.00	60	0	8,000	4,000	12,000	Freon	6½	1⅞ x 1⅞	600	1	1,000	0	0	460	550	45 x 32 x 17	1/20	1,140	(2) 6	550	250	‡
K	300.00	35	0	4,100	2,700	6,800	Freon	4	1⅝ x 1⅝	425	¾	650	0	0	350	425	36 x 32 x 15	1/40	1,400	10	275	250	‡
L	475.00	60	0	8,000	4,000	12,000	Freon	6½	1⅞ x 1⅞	600	1	1,000	0	0	450	535	43 x 33 x 17	1/40	1,400	12	550	250	‡

Remote Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind¶	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification* Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
G	$285.00	...	...	...	...	23,400	Freon	...	....	....	....	12	....	...	370	...	36 x 31½ x 14	1/20	850	(2) 7	500	300	...
H	264.00	...	...	...	...	23,520	Freon	...	....	....	....	12	....	...	334	...	26½ x 41 x 12½	1/20	1,140	(2) 6	500	300	...
M	378.00	...	...	...	...	31,700	Freon	...	....	....	....	12	....	...	380	...	27½ x 49 x 14	1/10	850	(2) 7	900	300	...
N	449.00	...	...	...	...	60,500	Freon	...	....	....	....	25	....	...	535	...	31 x 54 x 17	1/8	850	(2) 8	1,300	300	...
O	560.00	...	...	...	...	62,600	Freon	...	....	....	....	30	....	...	720	...	31 x 70 x 17	1/6	850	(2) 9	1,500	300	...
P	620.00	...	...	...	...	81,700	Freon	...	....	....	....	30	....	...	890	...	34 x 74 x 20	1/2	850	(2) 10	1,800	300	...

Suspended Type

12-B	$.....	...	0	....	....	22,800	Freon	...	....	....	....	7	...	0	...	115	19 x 19 x 18	1/30	1,140	12	500	...	...
16-B	.....	...	0	....	....	38,400	or	...	....	....	....	10	...	0	...	165	24 x 24 x 20	1/20	850	16	1,000	...	...
21-B	.....	...	0	....	....	69,000	Water	...	....	....	....	12	...	0	...	205	29 x 29 x 25	1/10	850	21	1,500	...	...

Suspended or Duct Type

62-H	$324.00	....	....	....	....	46,600	...	...	....	....	....	14	....	..	...	550	16 x 33 x 33	1/10	850	(2) 6	800	...	..
75-H	440.00	....	....	....	....	62,400	...	...	....	....	....	20	....	..	...	680	18½ x 36½ x 36	⅛	800	(2) 7½	1,100	...	..
76-H	625.00	....	....	....	....	90,000	...	...	....	....	....	30	....	..	...	780	18½ x 36½ x 43	¼	870	(2) 7½	1,500	...	..
92-H	806.00	....	....	....	....	128,000	...	...	....	....	....	40	....	..	...	925	22 x 39 x 47	½	720	(2) 9	2,500	...	..
93-H	952.00	....	....	....	....	192,640	...	...	....	....	....	50	....	..	...	1,581	22 x 39 x 69	½	720	(3) 9	3,700	...	..
94-H	1,110.00	....	....	....	....	239,640	...	...	....	....	....	55	....	..	...	1,728	35 x 39 x 85	1	720	(4) 9	5,000	...	..
122-H	1,224.00	....	....	....	....	239,640	...	...	....	....	....	55	....	..	...	1,798	30 x 44 x 61	1	750	(2) 12	6,200	...	..

Duct Type

62-V	$525.00	...	...	....	....	46,600	...	...	....	....	....	14	...	...	...	780	62x 33 x 14	...	...	..	800	...	...
75-V	625.00	...	...	....	....	62,400	...	...	....	....	....	20	...	...	...	925	66 x 36 x 17	...	...	..	1,100	...	...
76-V	755.00	...	...	....	....	90,000	...	...	....	....	....	30	...	...	...	1,050	66 x 43 x 17	...	...	..	1,500	...	...
92-V	918.00	...	...	....	....	128,000	...	...	....	....	....	40	...	...	...	1,497	77 x 47 x 23	...	...	..	2,500	...	...
93-V	1,122.00	...	...	....	....	192,600	...	...	....	....	....	50	...	...	...	1,780	81 x 69 x 23	...	...	..	3,700	...	...
94-V	1,304.00	...	...	....	....	239,640	...	...	....	....	....	55	...	...	...	1,860	82 x 85 x 23	...	...	..	5,000	...	...
122-V	1,324.00	...	...	....	....	239,640	...	...	....	....	....	55	...	...	...	1,960	86 x 67 x 26	...	...	..	6,200	...	...

*80° water used. †Total input for both condensing unit and blower. ‡See input watts under compressor. ¶Water may also be used.

Strang

Strang Air Conditioning Corp.
Kansas City, Mo.

Functions—Cooling, humidifying, dehumidifying, and cleaning.

Cabinet—Strang insulated steel cabinet, walnut finish.

Compressor—Copeland two-cylinder, air-cooled compressor on model 350; Deissler four-cylinder, air-cooled compressor on model 351. Repulsion-induction motor. High side safety cutout.

Blower—Strang.

Air Circulation—Air intake in back, discharge in front. Foul air exhaust provided. Strang discharge grille.

Self-Contained Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
350	$.....	...	0	....	....	....	CH_3Cl	4	2 x 2⅜	575	1	...	0	..	600	675	44 x 32 x 17½	...	...	..	325	475	...
351	.....	...	0	....	....	....	CH_3Cl	4½	1¾ x 1¾	600	1½	...	0	..	700	775	45 x 33½ x 19½	...	...	..	450	600	...

Zephyr Air

Savage Arms Corp.
New York, N. Y.

Functions—Cooling, dehumidifying, heating, humidifying, cleaning—all models.

Blower—Aluminum blower wheel.

Cooling System—Direct expansion or cold water.

Type of Humidifier—Air washing in all models.

Air Cleaning Medium—Air washing and scrubber plates.

Self-Contained Floor Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrigeration Capacity Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	Refrig. Capacity—WATER Dehumidification	Sensible Heat	Total B.t.u.	Water Circu. G.p.m.	Pressure Drop Lb/sq. in.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
60	$.....	....	....	....	....	9,000	Freon	...	....	....	....	..	....	6	...	...	.....	..	...	...	250	...	...

Remote Floor Type

61	$.....	....	....	....	....	9,000	Freon	...	....	....	....	..	....	6	...	...	.....	..	...	...	250	...	...
85	.....	....	....	....	....	15,000	Freon	...	....	....	....	..	....	12	...	...	.....	..	...	...	500	...	...

Duct Type

86	$.....	....	....	....	....	30,000	Freon	...	....	....	....	..	....	24	...	...	.....	..	...	...	1,000	...	...
88	.....	....	....	....	....	60,000	Freon	...	....	....	....	..	....	48	...	...	.....	..	...	...	2,000	...	...
90	.....	....	....	....	....	120,000	Freon	...	....	....	....	..	....	96	...	...	.....	..	...	...	4,000	...	...

Synchromatic

Synchromatic Air Conditioning Corp.
Milwaukee, Wis.

Functions—Cooling, dehumidifying, heating, humidifying, and cleaning.

Cabinet—Housing is of auto body steel, built on electrically welded steel frame. Housing is lined with felt. Exterior finish in green.

Blower—Double-inlet, squirrel-cage, slow-speed fan, with scroll housing and electric motor all mounted on a rubber-suspended chassis.

Air Circulation—Air inlet at end, air discharge at top. Fresh air intake as desired.

Cooling System—Direct expansion or cold water. Finned copper cooling coils.

Heating System—Steam or hot water. Finned copper coils.

Type of Humidifier—Spray jet humidifier connected through an electric water valve and strainer to normal water supply.

Air Cleaning Medium — Viscous treated spun wool filter.

Controls — Thermostat, humidistat, transformer, and solenoid valve.

Duct Type

Model No.	Price	SURFACES Cool Sq. Ft.	SURFACES Heat Sq. Ft.	Refrig. Capacity—DIRECT Dehumidification	Sensible Heat	Total B.t.u.	Refrigerant Kind	Charge Lbs.	COMPRESSOR Bore & Stroke	Speed R.p.m.	Motor Hp.	Input Watts	Heat Capac. B.t.u.	Humidification Lbs./hr.	WEIGHT Net Lbs.	Gross Lbs.	Overall Dimensions H. x W. x D.	BLOWER Motor Hp.	Speed R.p.m.	Diam. In.	Total C.f.m.	Veloc. F.p.m.	Input Watts
S-10FR	$510.00	....	....	....	....	30,000	...	...	.....	...	...	...	100,000	..	...	600	.....	..	...	...	1,400	...	...
S-15FR	605.00	....	....	....	....	48,000	...	...	.....	...	...	...	155,000	..	...	900	.....	..	...	...	1,700	...	...
S-20FR	752.00	....	....	....	....	96,000	...	...	.....	...	...	...	190,000	..	...	1,100	.....	..	...	...	2,200	...	...
S-30FR	813.00	....	....	....	....	120,000	...	...	.....	...	...	...	290,000	..	...	1,100	.....	..	...	...	3,200	...	...

EDITORIAL FEATURES OF COMING ISSUES—

Replacement Parts & Service Methods — Of special interest to Jobbers & Service Men — **June 17**

Engineering, Design, and Production — Reports of ASRE and ASHVE Conventions — **July 1**

Figure 4

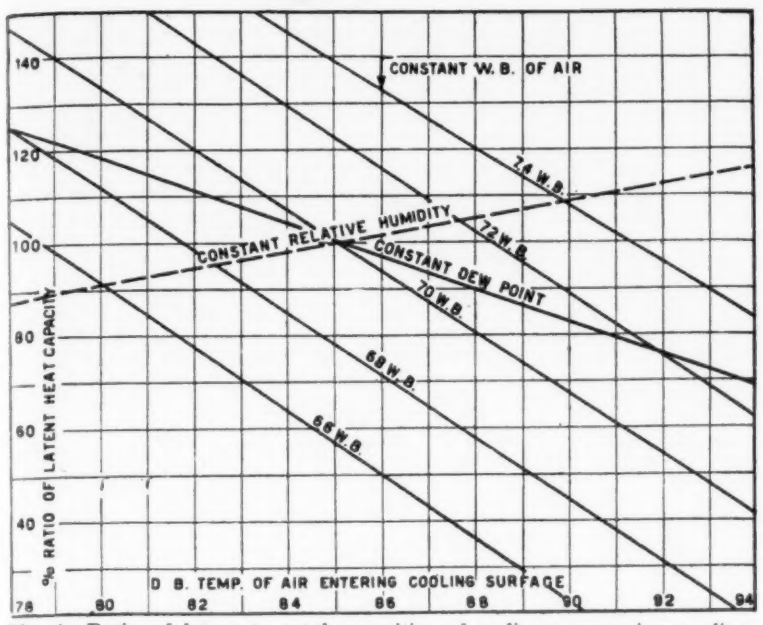


Fig. 4—Ratio of latent to total capacities of a direct expansion cooling system as a percentage of the value with entering air at 85° F. dry bulb and 70° F. wet bulb temperatures (variation with dry bulb temperature is shown for constant wet bulb temperature, constant dew point, and constant relative humidity).

Determining Proper Size of Equipment

(*Concluded from Page 17, Column 5*)

midity of the air leaving the cooling surface (point 3 of Fig. 2) are determined from equations (7a) and (8a).

$$t_2 = 85 - \frac{87{,}000}{1.06 \times 4000} = 64.5° \text{ F.}$$

$$w_2 = 90.4 - \frac{48{,}300}{0.66 \times 4000} = 72.1 \text{ gr./lb.}$$

Locating points 1 and 2 on the psychrometric chart, as referred to in connection with Fig. 1, and extending the straight line joining them until it intersects the saturation curve, the required surface temperature is found to be 54° F.

Mean Temperature Difference

The mean temperature difference between the air and the surface is, from equation (3),

$$(t_a - t_s)_m = \frac{85 - 64.5}{2.3 \log_{10} \frac{85 - 54}{64.5 - 54}} = 18.9° \text{ F.}$$

The selection of the amount of surface must be made by a trial and error process. Thus, try a face velocity of 500 ft./min. From equation (9),

$$A_a = \frac{87{,}000}{7.2 \times 18.9} = 640 \text{ ft.}^2$$

The required face area is

$$A_f = \frac{4000}{500} = 8.0 \text{ ft.}^2$$

This gives a ratio of outside surface to face area of 80, but the surface under consideration has a ratio of 38.4 (or 76.8 for two sections deep in the direction of air flow). Trying several face velocities, the following results are obtained:

Face Velocity ft./min.	Outside Area ft.²	Face Area ft.²	Ratio
400	720	10.0	72.0
450	677	8.9	76.2
500	640	8.0	80.0
550	605	7.3	83.2
600	583	6.7	87.4

It may be seen that 9 ft.² face area with two sections deep in the direction of air flow would be satisfactory. However, the surface is available only in multiples of 2 ft.² Hence, it is necessary to use 10 ft.² with slightly less than 4,000 ft.³/min., or 8 ft.² with slightly more than 4,000 ft.³/min. Other trys show that 10 ft.² will require 3,800 ft.³/min. and 8 ft.² 4,200 ft.³/min. Since the fan and duct system would be essentially the same in either case, 8 ft.² would be the more economical selection.

Finally, determine the refrigerant temperature for the latter case. The inside area is,

$$A_r = \frac{8 \times 2 \times 38.4}{9.9} = 62 \text{ ft.}^2$$

The refrigerant temperature is,

$$t_r = 54 - \frac{135{,}300}{200 \times 62} = 43.1° \text{ F.}$$

Choose a condensing unit to have a capacity of 135,300 B.t.u./hr. at a refrigerant temperature of 43° F., or enough lower to allow for any pressure drop there may be in the suction line.

Virginia Smelting Names Agent in South Africa

BOSTON—The Virginia Smelting Co., manufacturer of refrigerants, has appointed H. R. Hendy, Dominion House, 78 Anderson St., Johannesburg, as its agent in South Africa, reports A. H. Eustis, president.

Illuminating Engineer Discusses Problem Of Heat Generated by Lighting System As It Affects Air Conditioning

BOSTON—With the trend toward artificial cooling systems, and toward higher wattage capacities in illuminating interiors, more consideration must be given in the future toward the disposition of the heat generated by artificial light, Walter Sturrock, Iluminating Engineering for General Electric Co. told a joint meeting of the Air Conditioning Bureau and the Illuminating Engineering Society here recently.

Although it is a recognized fact that artificial light generates heat, in the past, Mr. Sturrock said, this has been of little consequence as far as the heating effect on the building.

How Energy Is Distributed

A gas-filled incandescent lamp operated at normal voltage distributes energy about as follows, according to Mr. Sturrock: light, 11%; heat, as invisible radiation in the infra-red region, 70%; heat conducted away through the supports and leads, 3%; heat dissipated by gas convection and conduction, 8%; and heat radiated by the bulb, 8%.

"In this way," he said, "from a clear bulb, gas-filled lamp, about 90% of the total energy is in radiant form. This will increase the feeling of warmth to the human body by its radiant effect, although its radiant energy will not be effective in raising the temperature of the interior of the lamp until it has been intercepted by an absorbing surface which in turn dissipates the heat by convection.

Determined by Type

"As far as lighting equipment is concerned," Mr. Sturrock explained, "the amount of radiant energy intercepted by it depends upon its type."

"The first thing to determine," he maintained, "is what proportion of the lighting system's energy is actually effective, and second, how to get rid of it. Much of it is radiant energy, which is hard to control; it must be changed to some other form of energy in order to make control possible."

The amount of heat from the lighting system that has an effect on the cooling system varies between 50% and 90%, Mr. Sturrock concludes. A safe figure, he thinks, would be 50% in the majority of cases. The temperature rises with the increase in wattage per square foot.

The effect of radiant heat which comes from a lighting unit or is re-radiated from the walls or ceiling and instantaneously produces a feeling of warmth, he said, can be counteracted by maintaining a lower air temperature in a building which is artificially cooled.

Only Part Forms a Load

"Not all of the radiant heat coming from the lamps, however, becomes a load on the system," the speaker stated. "A part passes through the windows to outdoors, and some is absorbed by the building through the walls, ceiling, and floor and is dissipated during the cooler night hours, the ceiling height having an important bearing upon this matter.

"With the lighting load at four watts per square foot, over a 7-hour period the temperature rise would be about 3° having doors and windows closed, and a regular cooling system," he estimated.

Complaints would come, Mr. Sturrock said, when, with 16 to 20 watts per square foot, the temperature rise would be about 14° to 16°. In some cases a false ceiling, open to the top light units, with an air intake on one side and an exhaust fan on the other side of the false ceiling could be used, he suggested.

90% in Radiant Energy

He explained that 90% of the heat from a lighting system is radiant energy. "We find that the lighting unit absorbs only about 66% of the heat by the use of absorbent glass under or covering the light unit, the balance being directed below and not horizontally through the false ceiling. Thus, 65% of the radiant energy goes down toward the floor. Cooling is then effected by forcing air through the false ceiling intake and across to the exhaust at rate of 400 c.f.m.

"Changing radiant energy to controllable energy could take care of a maximum of 60%," Mr. Sturrock claims. "With water cooling lamps, such as are used in some motion picture studios, we could transfer about 75% of the radiant energy. With heat absorbing glass at least twice as much heat can be removed by the ventilating air as is possible from the usual types of suspended lighting units."

Could Be Utilized in Winter

In winter, the speaker suggested, this heat could be utilized for an upper floor, being forced outdoors in the summer.

"The best solution of the problem on lights is extra cooling capacity when the amount of radiant heat is only 50%. But at 15 to 20 watts per square foot, we should use heat-absorbing glass and force out the extra heat by exhaust," he concluded.

New Canopy Introduced For Crosley Coolrest Bed Cooler

CINCINNATI — A new deluxe canopy for the Crosley Coolrest bed cooler has been introduced by the Crosley Radio Corp.

Of improved appearance, it is said to be especially suitable for those people who dislike to have their heads covered while they sleep. By simply twisting a little clamp at the support brace, the support nearest the head of the bed may be pushed down and shortened. This shortened support brings the canopy only to the shoulders, leaving the head exposed.

It is pointed out, however, that persons desiring relief from hay fever, asthma, or similar conditions, should always keep the canopy entirely over the head.

Extending very little above the bed level, the deluxe canopy has an attractive appearance and therefore adds to the beauty of the bedroom furnishings. The canopy is complete within itself, with supports and covering.

Three supporting bars, braced together at the bottom, are easily and quickly set on the bed rails. The canopy is tied to these supporting bars. A light spring in the hem of the band around the opening to the canopy makes it a simple matter to quickly fasten or unfasten it to the cooling unit. The unit is thereby easily pushed away when desired.

In addition to dehumidifying and cooling the air under the canopy, it has been shown by actual count that dust and pollen are practically eliminated from the air.

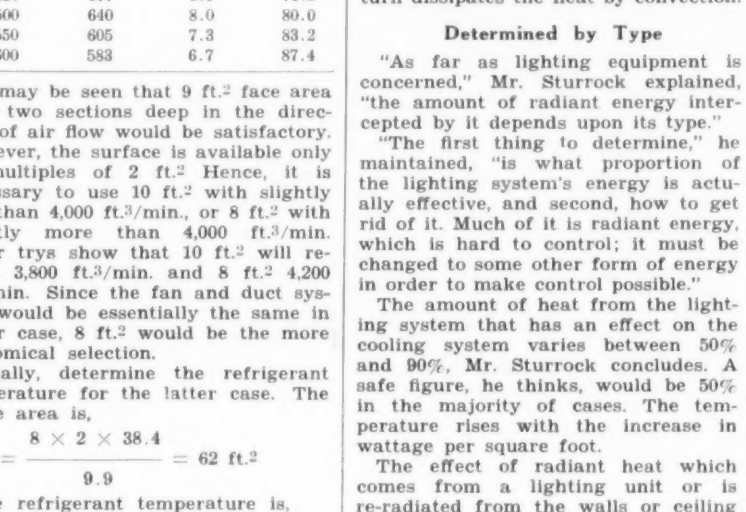
In a report made by the Allergy laboratories, it was shown that in a test for 25 days, beginning Aug. 28 and ending Sept. 21, the average pollen count was 5.36 pollen per cubic foot of air inside of the tent, while it was 44.02 pollen per cubic foot outside of the tent.

The standard model sells for $139.50 f.o.b. factory in Cincinnati, and the deluxe model for $150.

Timken Tapered Roller BEARING EQUIPPED

CURTIS

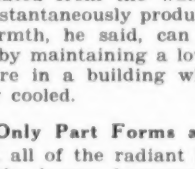
SCORES AGAIN



CURTIS pioneered the "V"-type Timken-roller-bearing equipped, pressure-lubricated refrigeration compressor which, at the time, was an innovation—now a generally adopted design.

Now CURTIS pioneers with a compact 30 Ton Dual Unit incorporating two proven "V"-type compressors driven by one motor.

Dual design permits automatic capacity control for variable air-conditioning loads.



Belt adjustment provided in all directions instead of usual vertical only.

A complete line of units up to 30 Tons.

CURTIS

CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Company
1912 Kienlen Avenue, St. Louis, Missouri

In Canada: Canadian Curtis Refrigeration Company, Ltd., 20 George Street, Hamilton, Ontario, Canada

Patents No. 2,025,973 1,850,049

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BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.
Telephone Columbia 4242.
Cable Address: Cockrell—Detroit

Subscription Rates
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VOL. 18, NO. 3, SERIAL NO. 374
MAY 20, 1936

The Air Conditioning Industry's Problem: SALESMEN

"How may ELECTRIC REFRIGERATION NEWS be most helpful in developing the market for air conditioning?"

We put the question to a gentleman from Schenectady recently after looking over the General Electric display at the oil burner show in Detroit.

After giving the matter some thought (and it appeared that he was really trying to think of some way in which a tradepaper could be useful to the General Electric air-conditioning program), he answered negatively.

His reaction was somewhat surprising, considering the fact that the General Electric Co. has had long and intimate experience with all manner of business publications and usually gives careful consideration to the possibilities of using them in every market development plan.

In fact, most General Electric men are uncommonly alert to the editorial influences and educational facilities of the trade press. Their attitude is not only friendly but highly constructive.

Some departments of the General Electric Co. maintain technical writers whose sole job is to prepare articles especially suited to the editorial columns of the various specialized magazines. This work has been done so well over a period of years that many editors unhesitatingly accept the material offered because it is invariably written as closely as possible in accordance with the editorial standard and viewpoint of the publication.

Therefore, when a General Electric man, earnestly engaged in promoting a new line of equipment for a vast and undeveloped market, could not think of any way in which an industry publicity medium of such standing as the NEWS could be helpful to him, the situation must be very unusual.

Recognizing our amazement, he took the trouble to explain some of the reasons for the self-sufficiency of the G-E air-conditioning department.

"We have been working on air conditioning for years," he said, "and each year we have been moving forward according to a well-developed plan.

"Several years ago," he continued, "we made a thorough survey of the potential market. Our line of equipment has been completely engineered from the ground up to meet the needs of the market. We now have a nation-wide dealer organization. We know just where we are headed and what we are going to do next."

Further inquiries brought forth the information that the company is not confronted with any difficult *technical problems* since its far-famed engineering department has adequate facilities to meet any situation.

There is no problem of *application engineering* since men have been fully trained for this purpose and are ready to draw up complete blue prints whenever and wherever needed by the sales department.

There is no problem of *local installation* since the company has a waiting list of trained mechanics who know how to install the equipment in accordance with the designs and instructions of the engineering department.

There is no great problem of *educating the public,* since air conditioning is already tremendously popular. Architects, contractors, and builders realize that any new building without air conditioning will be obsolete before it is finished.

In the commercial field, we were informed, it is scarcely necessary to go after the business since prospective buyers are taking the initiative this year. The job is simply one of preparing estimates and getting them submitted in time to meet the date for letting of contracts.

After getting this picture of the situation, we were beginning to wonder if we had been wasting our time in worrying about the air-conditioning industry. We were just on the point of thanking the gentleman from Schenectady and relieving our mind of all concern regarding air-conditioning problems (at least insofar as General Electric is concerned) when he bethought himself of *one* phase of the business which really is *a problem.*

With revived interest, we awaited his explanation of this one small detail which still remains a puzzle to the G-E air-conditioning executives.

The one and only difficulty, it seems, is that of *finding salesmen who can SELL air conditioning.*

We have an idea that *all* of the air-conditioning manufacturers are going to have a tough time *finding* competent air-conditioning salesmen. The chances are that it will be necessary to train most of them and that process is rather expensive.

There are a great many salesmen, however, whose past training and experience should provide an excellent foundation for successful sales activity in the air-conditioning field.

Electric Refrigeration salesmen, particularly those who have had *commercial* equipment experience, certainly represent a most logical group of prospects for the air-conditioning job.

The refrigeration industry has coralled the best specialty-selling brains in the country. They have come through the depression with their heads up. They know what it takes to get business in a competitive market.

Refrigeration salesmen know how to sell *performance* and *customer satisfaction,* but they also know the language of compressors, coils, and controls, and are already prepared to talk technical terms when necessary.

Refrigeration men have been trained in a rigorous school. They are willing to work and are anxious to get ahead. With such a large and fertile field to draw from, it would seem to us that any sales manager who overlooks these possibilities is going at his job the hard way.

Letters

The Bow and Arrow Used By Wilhelm Tell

Albert Staeheli Frigidaire
Elektrisch-Automatische Kuhlung
Vertreter fur die Kantone Basel, Aargau und Schaffhausen
Basle the 5th of May, 1936

Dear Sir:

In your No. of March the 11th, you have an ad of the Brunner Manufact. Co., showing a picture of William Tell.

Enclosed please find a picture Post card, showing the Tell-Monument at Altdorf, from which can see that the Bow and Arrow used by Tell were a little different.—However, thanks all the same for drawing the attention of your readers to the worthyness of a Swiss of the older days.

It is exactly what we try to reach now, to be competent, and I must say that what helps us a great deal is to read and study your paper.

Yours faithfully,
ALBERT STAEHELI

B. Lebrun—Inventor of the Rotary Seal

(Translation)
Societe Anonyme Des Ateliers
B. Lebrun
Nimy-lez-Mons, Belgium
March 7, 1936

Dear Sir:

Tour of Mr. Taubeneck

We have been subscribers, for several years, to your always interesting publication on the subject of refrigeration, commercial and industrial, and for which we wish to congratulate you.

We are the most important builders of refrigeration machines in western continental Europe, and follow with interest the trip of Mr. TAUBENECK.

We hope to have the pleasure of meeting him at the Hague and invite him very cordially to pay us a visit and lunch with us when he goes from Paris to the Hague.

Our factories are situated on the national route No. 2 connecting Paris with Brussels and we should be very happy to have a visit with Mr. Taubeneck, our plant being one of the oldest on the continent.

We are celebrating, in truth, at the end of this year, the fiftieth anniversary of the first Lebrun refrigeration installation: our founder, the late B. Lebrun was the inventor and builder of the first machine in the world with a rotating seal which replaces nearly everywhere, now, the horizontal compressor with alternate packing.

We trust that you will forward this letter to Mr. Taubeneck unless you prefer that we write him at this first address in Europe, as soon as you have published his address.

Our very best regards.

R. MALENGRETL

(Translation)
Societe Anonyme des Ateliers
B. Lebrun
Nimy-lez-Mons, Belgium
April 23, 1936

Dear Sir:

We have just received your letter of April 13.

It is with pleasure that we are awaiting the visit of Mr. Taubeneck.

We hope that one of our friends, Mr. Noordberg, of Amsterdam, who represents the firm Melchior, Armstrong, Dessau & Co., of New York, on the continent will be able to be with us on the same day.

We should like very much, therefore, to be informed as far in advance as possible of the day of his visit.

It is with pleasure that we are returning attached the translation made by Miss Betty Knight, completed as you requested. If we can be of any help to you in other translations, we are always at your service.

The correct translation of the word "bourrage" in the first case is in the sense of "Seal" as "rotating seal." In the second case, we also use the word "bourrage" in French, but we believe that you call this "packing." It really refers to the substance which separates the part of the compressor under pressure of ammonia from the atmosphere at the place where the power is appled.—That is to say the rubbing of the piston rod in the packing at the end of the cylinder of a horizontal compressor (b), a reciprocating movement causing, formerly, much leakage; and the rubbing of the shaft in a seal with rotating movement (a) in the case of a compressor crankcase under pressure.

It is the use of this crankcase under pressure which was the basis of the principal patent of the late Mr. LeBrun.

We are attaching to this letter two photographs which we hope will make this matter clear.

Whenever you want some information on refrigerating machines or applications on the Continent, we will be glad to be of service.

If you are interested, we can send you some cuts and, if you like, some articles for your paper.

We have among other things, the reproduction of the first plan of a refrigeration installation in 1886 and of a compressor of that time, which are quite amusing and which should certainly be of interest to your readers.

We will talk to Mr. Taubeneck about it at the time of his visit.

R. MALENGRETL

Australian Broadcasters Are NOT Pirates

Kelvinator
Export Division
Detroit
May 14, 1936

Publisher:

I was very sorry to read page 34 of ELECTRIC REFRIGERATION NEWS of May 6 a statement by George Taubeneck to the effect that the Australian broadcasting stations were using American radio programs without recompense to the talent.

I happen to be Chairman of the Directors of two broadcasting stations which are incorporated in a chain around the Commonwealth, of which the head is my colleague, Mr. A. E. Bennett, Managing Director of 2GB, Sydney, Australia's leading commercial station.

Mr. Bennett is Chairman of the Australian Association of Broadcasters, and I know that I can state on his behalf for all the Australian companies that every production we use is legally acquired and paid for. As a matter of fact, there is very strong competition amongst the broadcasting stations for American programs, and the business is treated on a strictly commercial basis.

I am sorry indeed that Mr. Taubeneck has sent in this impression to you.

WM. QUEALE,
Managing Director Kelvinator Australia Limited.

Consulting Engineer Commends Travelog

Samuel R. Lewis
Consulting Mechanical Engineer
407 S. Dearborn St., Chicago

Editor:

I cannot forbear taking the opportunity to commend your sending Mr. Taubeneck on his trip and to register myself as one subscriber in the affections of whom George Taubeneck has won, by his letters, a lasting place.

SAMUEL R. LEWIS

Urges Aggressive Action Against Misleading Advertising

Electric and Radio Association of Kansas City
805 Power & Light Building
106 West 14th Street
Kansas City, Missouri
May 11, 1936

Editor:

I certainly got a big kick in reading the complaint of the Federal Trade Commission against Coolerator Company as given in your May 6th issue. You have rendered a real service in printing that complaint.

The Coolerator Company is still carrying on some of its propaganda in newspaper advertisements. For instance, an ad in the May 3rd issue of the *Kansas City Star* says among other things, "With the patented air-conditioned chamber which constantly washes and humidifies the air of the food compartment, foods naturally taste better than those preserved in the dead air of mechanical refrigeration." Another ad of theirs in the May 10th *Kansas City Star* says, "In order to prove to every housewife that the bugaboo of dried out foods, the intermingling of food odors, and the bother and danger of covering foods are now quickly eliminated by this new step forward in refrigeration,.....".

Electric refrigerators are rendering a wonderful service to the public and there is no reason why they should not be defended aggressively and vigorously. I hope you folks will be able to stir up all the electric refrigeration interests to cease taking it on the chin and put forth the defense to which their products are entitled. We have a responsibility to the public in this.

G. M. WESTON,
Secretary-Manager.

Are Mail Order Boxes Made Cheaper?

Brown Co., Portland, Me.

Gentlemen:

I am seeking information on the relative merits of various mechanical refrigerators; that is, is the model of one manufacturer as good as some other manufacturer's? One of the mail order houses claims their box to be made by one of the big well known manufacturers yet there is a wide difference in the price. Is this because the manufacturer is getting more than is necessary or are cheaper materials, etc. used in the mail order refrigerator to enable them to sell at a price?

Is there any publication available that will give me answers to these and similar questions? Your cooperation will be much appreciated.

FRANCIS C. CURRAN

Answer: You will find detailed specifications covering all 1936 models of all makes of electric refrigerators in the April 22 issue of ELECTRIC REFRIGERATION NEWS. Extra copies of this issue are available at 25 cents each.

There are a great many variations in the quality of various models and makes of refrigerator. Some companies make three different grades, usually referred to as the the deluxe (best grade), standard (average grade), and popular price line (cheap, to meet competition). In most cases you will get just about what you pay for.

Corrections in G-E Commercial Data

General Electric Co.
Specialty Appliance Sales Division
Nela Park, Cleveland, O.

Editor:

In the specifications of commercial refrigeration equipment appearing in your May 6th issue, we note several small errors and omissions on specifications of General Electric refrigerating equipment which evidently occurred in transcribing the data submitted to the printed form.

The tabulation covering commercial condensing units omitted a note which read:

"Air and water cooled unit using Sulphur Dioxide available in sizes up to and including 2-hp. units."

On "T," "W," and "S" models a Penn water regulating valve is used as stated in the specifications but on the "L" models an Electrimatic water regulating valve is employed.

The features on our water coolers were interchanged so as to be incorrect. In order to correct this, I list the following features:

Type RM-51, 61, and 71 features: foot pedal control, heat interchanger, splash proof bubbler basin, vitreous china top, corrosion resistant water chamber.

Type RM-21 and BM-21 features: foot pedal control, heat interchanger, concealed contamination proof faucet, storage compartment.

We would appreciate having the above corrections made.

C. E. EHRENHARDT,
Commercial Engineering Division.

6 Copies of Specifications

Soukup Hardware Stores
House Furnishings, Electrical Goods
Sporting Goods, Toys
Elmhurst, Ill.

Editor:

Having noticed your article headed "First year dealer sells 207 Units," referring to the Carpet Line Store in Rockford, Illinois, I thought you might also be interested in publishing the inclosed article. (See story on opposite page.)

Also, we wish to express our appreciation for the April 22 issue, in which you cover specifications for all model refrigerators. We used six of them.

PHIL SOUKUP, JR.

Keeps in Step with Industry

30 Weybossett St.
No. Weymouth, Mass.

Editor:

Herein I enclose $3 for one year subscription of ELECTRIC REFRIGERATION NEWS, also 25 cents for a copy of your annual household refrigeration specifications issue.

I wish to acknowledge the sample copies of ELECTRIC REFRIGERATION NEWS which you so kindly sent me on request, and having thoroughly gone through same I am convinced that it is a wonderful paper and just the thing for this fast developing business. It is a splendid medium to keep one in step with up to the minute refrigeration and air conditioning.

FRANK HAILSTONE

13,857 Household Refrigerators Sold in First Quarter by Members of Electrical Association of Philadelphia; Sales 43% Better than 1935

Month	1936 Units Sold	1935 Units Sold	1934 Units Sold	1936% Inc. Or Decrease Over 1935	1936 Retail Value	1935 Retail Value	1936% Inc. Or Decrease Over 1935	1936 Average Price	1935 Average Price
January	2,532	718	1,069	+ 252%	$ 456,989	$ 137,558	+ 232%	$181	$191
February	3,657	2,634	1,329	+ 39%	681,667	488,499	+ 39%	186	185
March	7,668	6,357	3,363	+ 21%	1,349,089	1,115,435	+ 21%	176	175
Totals	13,857	9,709	5,761	+ 43%	$2,487,745	$1,741,492	+ 42%	$179	$179

Philadelphia Electric Co. Sells 613 Units in Quarter

Month	1936 Units Sold	1935 Units Sold	1934 Units Sold	1936% Inc. Or Decrease Over 1935	1936 Retail Value	1935 Retail Value	1936% Inc. Or Decrease Over 1935	1936 Average Price	1935 Average Price
January	81	53	117	+ 53%	$ 16,718	$ 10,923	+ 53%	$206	$206
February	160	104	103	+ 54%	29,623	18,383	+ 61%	185	176
March	372	302	231	+ 23%	70,191	57,386	+ 22%	188	190
Totals	613	459	451	+ 33%	$ 116,532	$ 86,692	+ 34%	$190	$188

Note: Utility sales approximate 4.4% of total sales. Report covers sales in Philadelphia, Bucks, Montgomery, Delaware, and Chester Counties. Report includes sales of the following makes: Apex, Coldspot, Crosley, Frigidaire, G-E, Grunow, Hotpoint, Kelvinator, Leonard, Norge, Sparton, Stewart-Warner, Universal, and Westinghouse.

Philadelphia Sales Up 43% For First Quarter of 1936

(Concluded from Page 1, Column 1)

total for 1936 shows $2,487,745, a 42% increase over the $1,741,492 in 1935's first quarter.

Of the 1936 total, 613 units or an approximate 4.4% were utility sales, slightly less than the total for the quarter last year.

Average unit price on utility sales was higher than the association average, and also higher than its own average price last year. In keeping with its smaller rate of sales increase, however, the Electric Co. shows only a 34% increase in retail value during the first quarter of 1936 over the same period of 1935.

The report as tabulated in the chart covers Philadelphia, Bucks, Montgomery, Delaware, and Chester counties. It includes sales of the following makes: Apex, Coldspot, Crosley, Frigidaire, G-E, Grunow, Hot Point, Kelvinator, Leonard, Norge, Sparton, Stewart-Warner, Universal, and Westinghouse.

Refrigeration News Sales Tips Help Dealer Sell 200 Units in First Year

ELMHURST, Ill.—Sales tips gleaned from ELECTRIC REFRIGERATION NEWS are credited with having helped the Soukup Hardware Store sell 200 electric refrigerators here during 1935, the first year in which it operated as an electric refrigerator dealership, says Phil Soukup, Jr., manager.

According to Mr. Soukup, a good display of a complete line of one make of electric refrigerators, backed by a reliable and well-established dealer, satisfying terms, and a well-organized sales force, are the requirements for selling refrigerators in quantity.

"Use of meter, 30-month payment plans, and sustained newspaper advertising were also important factors in helping us build up this sales volume," he added.

Since January of this year, when the firm took on the Westinghouse line in place of that previously carried, 40 refrigerators have been sold and, the manager states, 1936 sales are expected to exceed last year's.

From his experience, Mr. Soukup believes that a fair-sized, well-established hardware store can capitalize on its good will and reputation for reliability in selling refrigerators, because customers prefer to trade with a firm which they know and have confidence in.

The store is one of a chain of four Soukup Hardware stores located in the leading cities of Du Page county. Others are in Wheaton, Glen Ellyn, and Hinsdale.

34 Cents a Share Earned in Quarter by Stewart-Warner

CHICAGO — Stewart-Warner Corp. reports a net profit of $432,000, equal to 34 cents a share, for the quarter ended March 31.

This compares with $496,063 or 40 cents a share in the first quarter of last year.

Net sales for the first quarter of 1936 totaled $5,956,000, as against $5,262,000 for similar period last year.

Westinghouse 'Newlyweds'

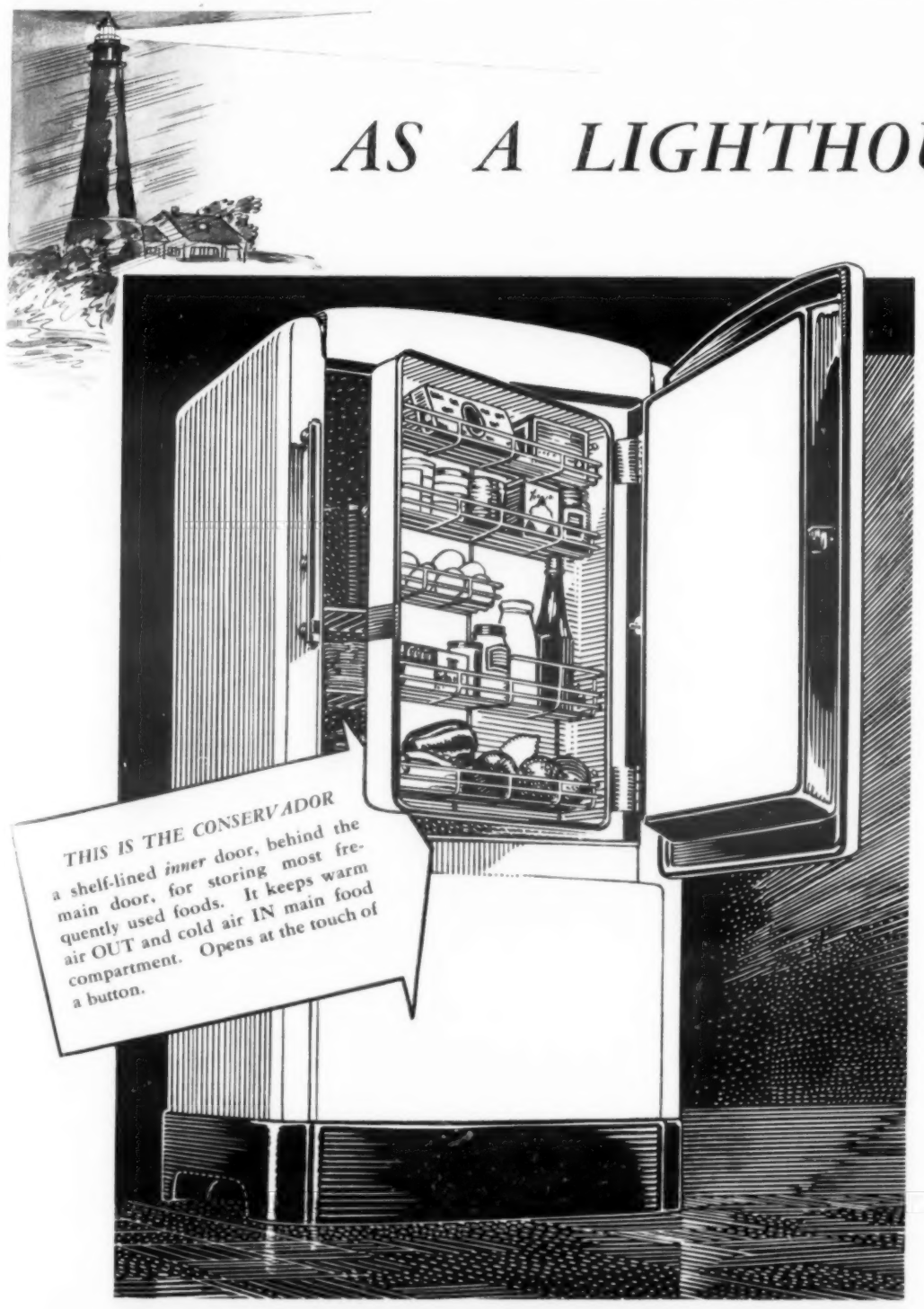
Eddie and Grace, stars of "The Honeymooners," NBC network program.

Abraham & Straus to Be Only N. Y. Dept. Store Handling Monitor Top

NEW YORK CITY—Abraham & Straus, Brooklyn, has been given the exclusive department store franchise in the New York metropolitan area for General Electric Monitor Top refrigerators by Rex Cole, Inc., New York City G-E distributor, it was learned last week.

Department store distribution of G-E refrigerators is now confined to two stores—Abraham & Straus, handling the Monitor Top, and Macy's, handling the Flatop series. Both lines, however, will continue to be sold through Rex Cole controlled retail stores in the metropolitan area.

AS A LIGHTHOUSE IN A FOG


THIS IS THE CONSERVADOR
a shelf-lined inner door, behind the main door, for storing most frequently used foods. It keeps warm air OUT and cold air IN main food compartment. Opens at the touch of a button.

Conservador Demonstration

lifts the confusion from prospects' minds - - - *GETS THE ORDER!*

• What would you do if you were a refrigerator *buyer,* instead of a *seller?* Claims, counter-claims, and more claims. Every refrigerator on the market claims everything! Man alive! No wonder customers are in a fog! Especially those "hard ones" who are trying to give serious thought to size, quality, operating cost, and ability to stand up under all conditions. In other words, the *profitable* class of prospects who buy refrigerators instead of price tags. These are the very sales you want—and these are the sales that Fairbanks-Morse dealers *are getting.* Why? How?

The Fairbanks-Morse is the ONLY refrigerator on the market which provides the dealer with a money-saving feature that can be demonstrated—that the buyer can see, touch, and easily understand. That feature is the CONSERVADOR. Prospects can see what it does in a split second, and understand how it does it. Just open the main door of the Fairbanks-Morse and show them the CONSERVADOR. Frankly, it's the greatest sales-*clincher* ever engineered into a refrigerator.

In addition to that, the Fairbanks-Morse has everything else that any other refrigerator offers—*plus* CONSERVADOR economy and CONSERVADOR convenience, found in no other.

Get the facts about the F-M franchise. Write or wire Fairbanks, Morse & Co., Home Appliance Division, 2060 Northwestern Ave., Indianapolis, Ind.

Conservador Refrigerator Machine Units are warranted for five years under an optional warranty purchase plan.

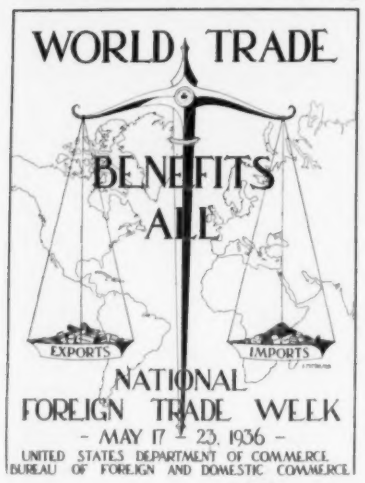
FAIRBANKS-MORSE Refrigerators

OTHER FAIRBANKS-MORSE PRODUCTS:
WASHING MACHINES — IRONERS — RADIOS — AUTOMATIC COAL BURNERS

Around the World

With George F. Taubeneck

Following are the cities visited by the editor and the dates of the issues in which his travelog reports have appeared in the News:



Jan. 8, 1936—Detroit, Mich.; Jan. 15—Jackson, Mich., and Chicago, Ill.; Jan. 22—St. Louis, Mo.; Jan. 29—Claremore and Tulsa, Okla.; Feb. 5—Dallas, Texas; Feb. 12—El Paso, Texas, and Juarez, Mexico; Feb. 19—Yuma, Globe, and Phoenix, Ariz.; Feb. 26—San Diego, Calif. (California Pacific Exposition); March 4—Los Angeles and Hollywood, Calif.; March 11 and 18—San Francisco, Calif.; March 25, April 1 and 8—Honolulu, Hawaii; April 15—Pago Pago, Samoa, and Suva, Fiji Islands; April 22 and 29—Auckland, New Zealand; May 6—Melbourne, Australia; May 13 and 20—Sydney, Australia.

Modern Showrooms & Modern Sales Ideas Characterize Sydney Dealerships

Modern Super Store

No American department store this writer has seen has so modern an appearance as the David Jones store in Sydney. Its interior could have been lifted right out of Chicago's *A Century of Progress* exposition, and we'll bet even those artists in light at Nela Park would be impressed by the lighting effects.

The store is modern in other details, too, with an air-conditioning basement and a Food Hall (adjacent to which the refrigeration department may be moved.)

At present Kelvinators are displayed on the second floor (which would be third in America—Australians start their count with the floor above the ground floor) in the arrestingly handsome electrical appliance department.

Also on display up there are large numbers of Australian-made radios, Easy washers, Hoover vacuum cleaners, and many varieties of small electrical appliances.

Twelve outside salesmen are busy selling Kelvinators for the David Jones store, and during the busy season their numbers may be swelled to 20. They are backed up, and preceded, by strong newspaper and direct mail advertising campaigns. Floor traffic in that department is light.

Had an interesting visit with JIM BEVERIDGE, refrigeration sales manager, and THOMAS MATHEWS, both live fellows and both enthusiastic regular readers of ELECTRIC REFRIGERATION NEWS.

* * *

When Frigidaire Reigned

Before the days of the prohibitive tariffs, Frigidaire and Kelvinator had the refrigeration field, both household and commercial, pretty much to themselves. Equipment was imported *in toto* from the United States, sales were good, profits were high.

Warburton, Franki, Ltd., had the Frigidaire agency for Australia then, as it has now. There seems to be no question among those who remember "way back when" that Frigidaire dominated the market before the coming of the tariffs.

After the restrictive duties were imposed upon American-made products, Warburton, Franki couldn't do much but pull in their horns, fold up their tents, and hope for a new government.

GEORGE WARBURTON, managing director of the firm, was in Dayton when the writer called (later we had a pleasant visit with ALLEN WARBURTON, brother of George, in Brisbane).

We were assured that Frigidaire is still being sold in Australia, and is definitely a factor; although it no longer reigns supreme.

* * *

The Incomparable Freddie

When Frigidaire had its hey-day in Australia, a young man by the name of FREDDIE LOVELOCK was the sales manager of the Warburton, Franki forces. And you can get a fight on your hands very quickly any place from Darwin to Adelaide if you intimate a doubt that Freddie was not the greatest refrigeration salesmanager who ever lived.

All over the industry you'll find men he trained. Apparently he was a go-getter from the word "go," a man who wouldn't quit or let-up, a driver who browbeat his men into the hardest sort of effort, made them like it and love him.

His record of 250,000 pounds (about $1,200,000 then) worth of refrigeration business in 1929 has never even been approached by any other firm in Australia since that time.

After the tariff restrictions went into effect, Warburton, Franki dropped all its sales force except Lovelock, who found himself ringing doorbells.

This was no job for an organizing genius like Mr. Lovelock, so he went into the business of supplying refrigeration parts and accessories to the trade.

Insmuch as nearly every firm he called on had one or more of his old men in its employ, Freddie wouldn't take no for an answer, and loaded everybody up with parts whether they needed them or not.

He so on built quite a business.

Before long he decided he'd like to represent ELECTRIC REFRIGERATION NEWS in Australia. At that time the NEWS had no representatives of any kind—advertising, subscription, or editorial—anywhere in the world. Everything was centered in Detroit.

But so high were the praises of Mr. Lovelock from all Australian visitors, and so well did he sell us on the idea, that Mr. Cockrell decided to break precedent and make him our only representative.

Unfortunately and sadly, the news of his appointment arrived after his untimely death on an operating table.

* * *

Hansen Carries On

F. C. Lovelock & Co. did not die with its founder. It is still going strong, getting bigger, and is providing the widow with a fine income.

New manager is FRANK HANSEN, another go-getter who also has great personal popularity around the trade. Frank came into refrigeration a greenhorn. Previously he had been in show business, his last position prior to being offered the Lovelock managership being that of operating a radio broadcasting station.

But he worked hard and studied furiously—his textbook being ELECTRIC REFRIGERATION NEWS—and now has it well in hand. Frank is at once a high-powered salesmen, a comedian, an all-around good fellow, and a hard-headed, close-fisted business man.

He took personal charge of our visit to Australia, and ran us around the country at such a dizzy pace that we were quite exhausted before the visit was concluded.

* * *

F. C. Lovelock, Ltd.

In addition to refrigeration supplies, "Lovelock's" handle heat and oil burning accessories.

Clients through Australia are not solely refrigeration and heat or oil burning merchants, but jointly handle electrical apparatus, petrol motors, farm lighting units, cabinet ware, hardware, and air-conditioning plants.

"Lovelock's" at present represent the following overseas connections:

The British Thermostat Co., Ltd.
Packless Gland Co.
Grand Rapids Brass Co.
Kerotest Mfg. Co.
Bishop & Babcock Mfg. Co.
BUSINESS NEWS PUBLISHING Co.
Melchoir, Armstrong, Dessau Co.
Manning, Maxwell & Moore, Inc.
Bailey, Grundy & Barrett.

It will be noticed that among this list appears the name of Melchoir, Armstrong, Dessau Co., which in turn is export factor for the following:

Merchant & Evans Co.
Esco Cabinet Co.
United Copper Tube Co.
Fedders Mfg. Co., Inc.
Emery Thompson Machine & Supply Co.
Detroit Lubricator Co.
Automatic Reclosing Circuit Breaker Co.
Barostat Co.
C. J. Tagliabue Mfg. Co.
Alco Valve Co., Inc.
Henry Valve Co.
U. S. Gauge Co., Inc.
Imperial Brass Mfg. Co.
Turner Halide Co.
Ansul Chemical Co.
Standard Gas Equipment Corp.
Howell Motor Co.
A. C. Horn Co.
Superior Carbon Products, Inc.
Clifford Mfg. Co.

In addition, "Lovelock's" represent the following Australian electric refrigeration and allied manufacturers:

Electricity Meter Mfg. Co.
Electric Engineering & Construction Pty., Ltd.
Harris-Hutchinson & Co., Ltd.
W. H. Hole & Co.
F. Muller, Ltd.
W. H. Brewer Pty., Ltd.

The company is also a large importer of sulphur dioxide, methyl chloride, Freon, and other refrigerants.

Being located in Sydney, F. C. Lovelock, Ltd., is right in the heart of

(Continued on Page 23, Column 1)

Department Store Selling—Sydney Style

Two views of the appliance department of David Jones department store, Sydney, which George Taubeneck says is one of the most modern he has ever seen. Kelvinator refrigerators, Easy washers, and Hoover vacuum cleaners are among American home appliances displayed there. In the picture at the right are Jim Beveridge, refrigeration sales manager of the store, and William Queale, manager of Kelvinator, Australia.

Aggressive Australians

These men play important parts in the refrigeration industry in Sydney. Upper left: W. A. Donner, manager of the Gramophone Co., Ltd. (Australian Branch), Norge distributor for the country. Upper right: Jim Beveridge, refrigeration sales manager for David Jones department store, with William Queale, manager of Kelvinator Australia, Ltd. Lower left: Thomas Mathews of David Jones store is a regular reader or the News. Right: Mr. Mathews is joined, in his reading, by Mr. Beveridge, another "constant reader" of the News.

At Sydney's Electrical Show

Scenes at Sydney's annual electrical exposition, in progress during George Taubeneck's visit to that Australian city. Held in Town Tall, the exposition drew large crowds. Exhibits shown in the group include Electrolux (upper right) and Genelex (British General Electric Co.), lower right.

Railroad Air Conditioning and Other Scenes on Sydney's Streets and Beaches

(1) When Australian railroads air condition their coaches, they really make a feature of it. This car, on the Melbourne-Sydney run, was conditioned by J. Stone & Co., Ltd. It is a 4½-hp. Freon job, with power take-off from the axle. (2) Not an uncommon sight along Australian highways. Traffic stops while sheep cross the road. (3) Sidelight on the editor's Jervis Bay week-end. All cars in the party bore "Refrigeration" flags, as shown here. (4) A couple of husky Australian beauties, snapped on Bendi beach, Sydney. (5) World war memorial, Sydney.

(*Continued from Page 22, Column 5*)

the biggest manufacturing center in Australia. Refrigeration manufacturers and distributors in the other states are served by Lovelock's branches, which are located in Melbourne, Adelaide, Brisbane, and Perth.

In addition to Mr. HANSEN, the Sydney office has J. H. LIDDLE as sales engineer, and J. FENNELL, accountant.

Managing the interstate branches are: R. E. TRICKEY, Melbourne; E. TRELIVING, Adelaide; J. G. PRITCHARD, Perth, and P. H. PHILLIPS, Brisbane.

Stocks are carried at each branch, and the head office in Sydney regularly carries stocks valued in the vicinity of $60,000.

"Lovelock's" is definitely an institution in Australia, and apart from supplying the needs of the refrigeration trade, the company acts as a clearing and information bureau for the whole industry.

The trade especially looks to "Lovelock's" to obtain from America information and goods which are out of the regular line.

Being the representative of the News is a big help, Mr. Hansen admits, for it labels the concern as the place to *find out* things about refrigeration and refrigeration products.

And if people look to him for *information* on refrigeration, that's all he wants. Selling them something then becomes relatively simple.

* * *

Refrigeration Supplies Co.

Another important manufacturers' agent in Sydney, beside Lovelock's, is Refrigeration Supplies Co., of which BENJAMIN B. MAYE is general manager.

Mr. Maye gave us a most cordial welcome to Australia, offering us the use of his car in traveling about Sydney, and his private office, if we wanted it, in preparing our copy. We regret that we weren't able to spend some time with him.

Refrigeration Supplies Co. is Australian representative for the following firms:

Penn Electric Co.
American Injector Co.
Allen Bradley Co.
Automatic Products Co.
Rocke International Electric Corp.
Humidi-Cooler Corp.
Riley Engineering Corp.
Fee & Stemwedel, Inc.

The company also is representative for several prominent British manufacturers, and obviously has something to say about what's what in Australia's refrigeration industry.

* * *

Carrier Pioneers

Practically the only air-conditioning firm operating on any scale at all in the down-under country is Carrier of Australia.

This firm is entirely owned by Australian capital, having been formed by a group of textile men who had the American Carrier Corp. install air-conditioning equipment in one of their mills, and who forthwith saw the possibilities in the business.

Messrs. R. PLACKETT, E. HOLDER, and E. COLLIER are among the leading engineers of this firm (Plackett was trained by the American firm) and we had a short visit with them.

They told us that nearly 200 air-conditioning installations had been made by their firm thus far in Australia; but that the business should double and treble and quadruple in the next couple of years.

Thus far most of their installations have been of the industrial variety, although a few commercial jobs have been sold, a number of theaters, three homes, and two office buildings.

Prices are very high—an ordinary restaurant installation running around 2,000 pounds ($8,000).

* * *

Other Air Conditioning

Previously it has been noted that the Werner organization in Melbourne is now going after air-conditioning business, and that WILLIAM QUEALE of Kelvinator Australia is getting ready for it.

One other concern that should be mentioned in this connection is J. Stone & Co., Ltd., 11 Phillip Street, Sydney, an English-controlled firm which has the contract for air-conditioning the Victorian government railways. Thus far they have done one—a dining car on the Melbourne-Sydney run, in which we rode. It is a 4½ hp. Freon job, with power take-off from the axle.

* * *

'His Master's Voice'

Norge refrigerators in Australia are sold under the trade name, His Master's Voice, or under the initials, H. M. V. This trade name has no relation or reference, we should hasten to assure all American dealers who have attended Norge conventions, to JOHNNY KNAPP.

It simply means that Norge refrigerators are imported from England rather than the United States, and that in England they are sold by Electrical and Musical Industries, Ltd., which puts the label, His Master's Voice, on all its products.

The Gramophone Co., Ltd. (Australian Branch) is the representative in the Antipodes of this English concern. Chief business of the Gramophone Co. is the manufacture and sale of records for phonographs, which have a big sale in Australia.

Secondarily they make phonographs and radios (production on which is just beginning in the Sydney plant of the concern). In the last year or so this firm has begun to merchandise H. M. V. electric refrigerators, household only.

W. A. DONNER is manager of the company, and C. F. TYLER is in charge of refrigeration sales. They have found it feasible to work only through specialty dealers, who sell radios, washers, and stoves, generally, in addition to refrigeration.

Department stores, furniture stores, and hardware stores have not been successful refrigeration merchants, this concern has found.

All H. M. V. dealers maintain a crew of outside salesmen, who canvass their territories thoroughly, working on commission and salary. Like most Australian specialty salesmen, they don't undergo much formal schooling or training, but are supervised rather carefully.

* * *

Sales Appeal

Because they are relatively new in the business, these two gentlemen have made a close study at first hand of *what appeals* to the Australian prospect for an electric refrigerator.

First of all, they say that frozen desserts and ice cubes seem to induce the most enthusiasm and envy among non-owners of electric refrigerators—hence that's the first thing their salesmen are taught to demonstrate.

They agree that health and economy *should* be the chief arguments and the chief appeals for refrigeration prospect, but they just aren't.

After a prospect has been sold on the idea of an electric refrigerator, the principle determinant in making a choice between different makes is *eye appeal.*

In Australia streamlining and slick hardward mean much more than fancy gadgets. Appearance is far more weighty than convenience features in making the buying decision.

* * *

Handicaps

Perhaps the biggest handicap to the refrigeration business, in the minds of these gentlemen, is the service problem they encounter when trying to take care of refrigerators scattered over such great distances as prevail in Australia.

Say a dealer gets three service calls during the day. One may be 270 miles away, the second 86 miles in another direction, the third 450 miles distant. Sending a service man around to calls like that is expensive business.

(We might add that we heard this complaint—and staggering anecdotes in the life and travels of Australian service men—wherever we went.)

Still another handicap they face is the hold that multiple systems seem to have on the "flat" (apartment house) market. Installers of multiple systems get the cost down to 29 pounds a box, which is tough competition.

* * *

Distribution

Seven dealers sell H. M. V. refrigerators in Sydney, working under the Westcott Hazell distributorship. H. M. V. distributors throughout the Commonwealth are as follows:

New South Wales:
Westcott Hazell & Co., Ltd.
225 Castlereagh St., Sydney.

Victoria:
Columbia Graphophone (Australia) Ltd.
347 Flinders Lane, Melbourne (A company branch).

Queensland:
Messrs. King & King Ltd.
Queen St., Brisbane.

South Australia:
Messrs. Allan's Ltd.
51 Rundle St., Adelaide.

West Australia:
Messrs. Nicholsons Ltd.
Barrack St., Perth.

Tasmania:
Messrs. Findlay's Pty., Ltd.
80 Elizabeth St., Hobart, and Corner Brisbane & George Sts., Launceston.
Messrs. Wills & Co., Pty. Ltd.
84 Elizabeth St., Hobart, and 7 Quadrant St., Launceston.

* * *

Harris Hutchinson

Largest builder of refrigerator cabinets in Australia is Harris Hutchinson & Co., Sydney. Chiefly this concern, of which GEORGE HARRIS is managing director, manufactures commercial wall-type and display cases, although the factory also turns out some household jobs, particularly for "flat" installations.

Electricity Meter Mfg. Co. and New Systems Telephones have first call on the Harris Hutchinson production, but Mr. Harris manages to supply most of the major sales organizations in Sydney as well.

Twice a year Mr. Harris tours the

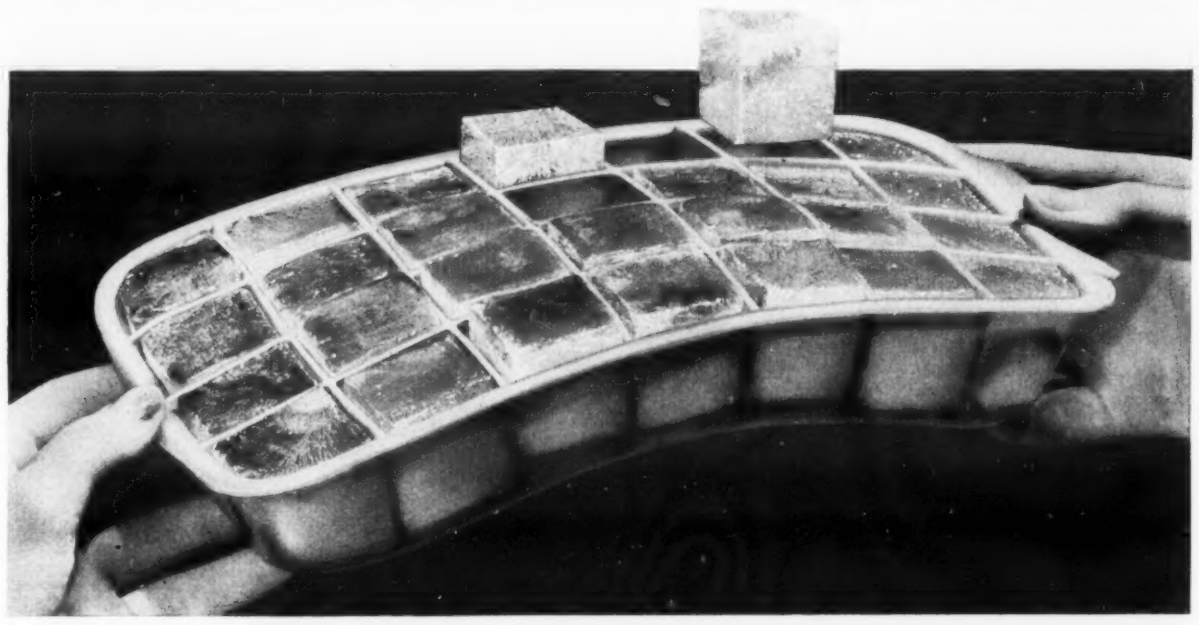
(*Concluded on Page 24, Column 1*)

Some of Sydney's Distributorships

(1) Town Hall, Sydney, where the annual electrical exposition was being held at the time of George Taubeneck's visit to that city. (2) An attractive Frigidaire showroom in the city's downtown section. Warburton, Franki, Ltd., is agent for the company in Australia. (3) A lighted show window in the headquarters of His Master's Voice, Norge distributor for the Commonwealth. The refrigerators are imported from England.

Helping Australian Appliance Sales

The urge to modernize is on in Australia, too, these candid camera snapshots of window displays in the municipal utility headquarters in Sydney indicate. The displays are designed to show the progress which 25 years has brought in home appliances. The window at upper left features washers; lower left, ranges; and lower right, refrigerators.



The Odds are 99 to 1 in your favor

When it comes to selling the ice tray convenience of your refrigerator, the odds are 99 to 1 in your favor if you offer complete Flexible Rubber Tray and Grid equipment. This is the inevitable conclusion shown by a survey among recent refrigerator purchasers—99% of whom express a definite preference for this modern method of getting ice cubes.

This consumer demand for Flexible Rubber Trays and Grids can be of tremendous value to your salesmen. Prospects will be easier to close when they learn that they get ice cubes at the refrigerator . . . that the cubes pop instantly from tray to glass . . . that all ice cubes are full-sized, cold, and dry. They will appreciate the extra convenience of this truly modern refrigerator feature which saves time, temper, and ice.

Give your salesmen this valuable confidence-inspiring, sales-closing advantage. Insist that the refrigerator you expect them to sell comes factory-equipped with a Flexible Rubber Tray or Grid in every ice compartment.

THE INLAND MANUFACTURING COMPANY • DAYTON • OHIO

A TRULY MODERN REFRIGERATOR SHOULD HAVE A

FLEXIBLE RUBBER TRAY OR GRID

IN EVERY ICE COMPARTMENT

Around the World

With George F. Taubeneck

(*Concluded from Page 23, Column 5*)

continent on a selling trip, thus attaining nation-wide distribution.

Mr. Harris started out with a back yard and a hammer 10 years ago, and is now one of Sydney's leading business men. He has studied cabinet manufacture in the United States.

* * *

Waugh and Josephson

Leaders in the "flat" refrigeration business, Waugh and Josephson, Ltd., also manufacture practically everything in the refrigeration line, from a complete household refrigerator to an 80-ton duplex industrial ammonia machine.

Since 1880 this concern has been manufacturing ammonia machines, from 1 ton capacity up. Recently W. & J. has installed 900 tons of refrigeration and more than three miles of expansion coils in one building—a government *abattoir,* where beef is frozen for export.

All cabinets are made in the Sydney plant, as are the industrial machines. Sulphur dioxide compressors for small commercial installations and household jobs are manufactured in Brisbane.

In the last two years W & J has installed refrigerators (multiple system) in more than 100 blocks of "flats" in Sydney, and since last June this firm has sold more than 100,000 pounds ($400,000) worth of refrigeration equipment in the states of New South Wales and Queensland.

Two types of commercial refrigeration into which W & J does not enter are florists boxes and water coolers. There is no demand for either. Australians drink beer, not water. And flowers are so plentiful and cheap that what the florists don't sell they throw away. (The writer enjoyed a millionaire-like thrill, when he was able to fill the room of a ladyfriend with fragrant blooms—literally armloads went up—for 10 shillings, or about two dollars!)

Cork is used for insulating all W & J commercial cabinets, corrugated paper for the household jobs.

* * *

Better Salesmen

Like most refrigeration sales organizations in Australia, W & J consider salary and commission the best method of compensating salesmen.

This method of compensation attracts a better type of salesman, according to L. TUTT, manager of W & J for New South Wales. If a salesmen is paid entirely in commissions, he is apt to split his commission with customers just to get the order—and that is poor business, generally followed by kick-backs and repossessions.

Mr. Tutt directs the efforts of a dozen salesmen in Sydney. They work on a straight canvassing plan. However, they do not call on homes—all the "flat" business is done with operators and speculative builders.

A. McPHERSON is managing director of Waugh & Josephson.

* * *

Among Those Present

Roseberry Engine Works of Sydney manufactures Westinghouse commercial equipment and household cabinets at its Waterloo plant. The hermetic household machines are imported whole from America. They are sold on a four-year service guarantee.

F. G. CARR is managing director for Westinghouse-Roseberry sales, and is a faithful reader of ELECTRIC REFRIGERATION NEWS.

We called on E. F. WILKS & Co., a Sydney music house which handles retail distribution of Westinghouse-Roseberry products, and met Sales-manager JIMMY WOOD.

Mr. Wood was especially enthusiastic over the combination ice cream cabinet, ice bar maker, and display case which was being made out at the Roseberry plant, and which was enjoying a good sale in Sydney.

Airzone, Ltd., sells Crosley in New South Wales, chiefly through music stores. General Electric Monitor Tops are sold (in small quantities to wealthier people) by the Australian General Electric Co., of which J. K. LANCASTER is manager of the refrigeration department.

* * *

Ice

Except in Melbourne, where the ice manufacturers have combined in a cooperative campaign to promote and rescue their business, ice making and selling is rapidly becoming a dead letter in Australia.

In Sydney ice cost sixpence for 15 pounds, or almost a cent a pound. It is delivered dirty—frequently from the same wagons in which coal has been hauled.

Ice manufacturers in Sydney are small, unorganized and uncooperative. They are making no attempt to protect the remnants of their fast-waning commercial business. Only in Melbourne can decent temperature-holding ice refrigerators be obtained.

It's the concensus of refrigeration opinion in Sydney and Brisbane that icemen deserve the "knock" they are taking.

* * *

Deep-Sea Fishing

Climax of Mr. Hansen's plans for entertaining the editor during his stay in Sydney was a week-end party in our honor at Jervis Bay, which is the Riviera of Australia.

A number of men in the Sydney refrigeration trade attended (they drove out in cars bearing banners with the single word, "REFRIGERATION"), but try as we might, we could not get any interviews. Everybody insisted that we forget refrigeration and have a big time.

Big event on the schedule was a day of deep-sea fishing. That was quite an experience for a landlubber like us.

There were also tennis, golf, dancing, and general hilarity swimming around us on all sides.

Jervis Bay is about 120 miles from Sydney, and was formerly a governmental naval training station. Now the barracks and quarters and grounds are in use almost constantly as a playground for tired business-folk. It's quite a spot.

Those who attended were:

L. HOLDER, Carrier (Australasia) Ltd., air conditioning, 41 Forbes St., Woolloomooloo, Sydney.

W. M. BATE, Mills & Bate, cabinet makers, 7 Hiles St., Alexandria, Sydney.

MILTON KENT, commercial photographer, 19 O'Connor St., Haberfield, Sydney.

GEORGE HARRIS, Harris Hutchinson & Co., Ltd., cabinet makers, Bowden St., Alexandria, Sydney.

COLIN SINDELL, Waugh & Josephson Ltd., refrigeration manufacturers, Unwin's Bridge Rd., St. Peters, Sydney.

CECIL SCHARTL, A. A. McCULLAGH, F. LAYER, A. SCHULTZ, and A. E. GIBBES, Electricity Meter Manufacturing Co. Ltd., manufacturer, Joynton Ave., Waterloo, Sydney.

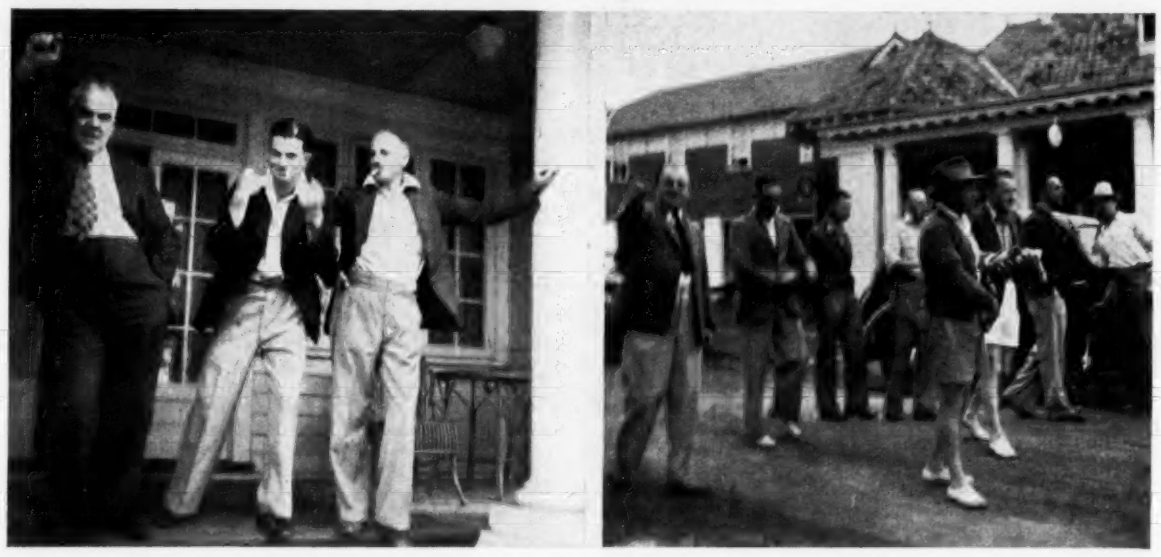
R. M. DAVIS, LEO WESTOFF, and LOU AMBROSE, New System Telephones Pty. Ltd., distributor of Electrice & Leonard, 276 Castlereagh St., Sydney.

MAX MULLER, F. Muller Ltd., evaporators, ice trays, etc., 77 Parramatta Road, Camperdown, Sydney.

ERIC EBELING, Dangar, Gedye & Co. Ltd., Kelvinator distributors, 10 Young St., Sydney.

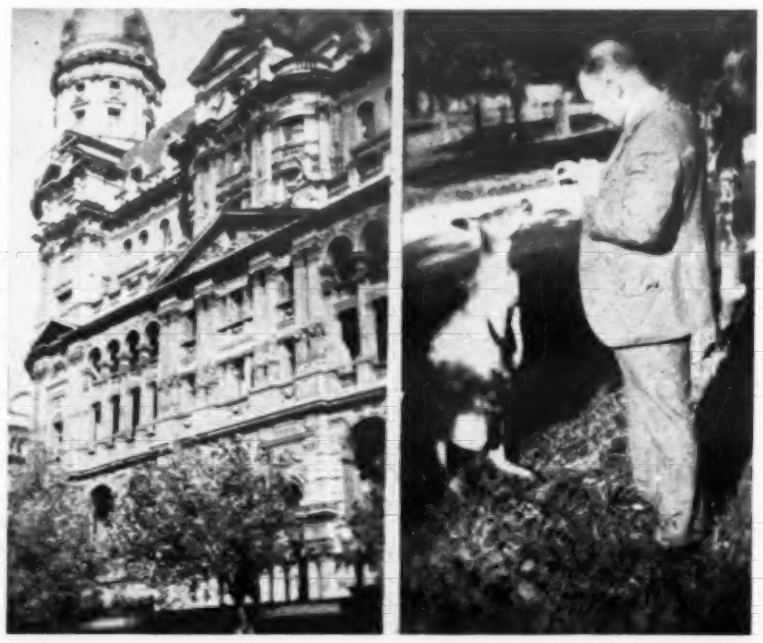
R. PLACKETT, and E. COLLIER, Carrier (Australasia) Ltd., Forbes St., Woolloomooloo, Sydney.

A Week-end of Deep Sea Fishing at Jervis Bay

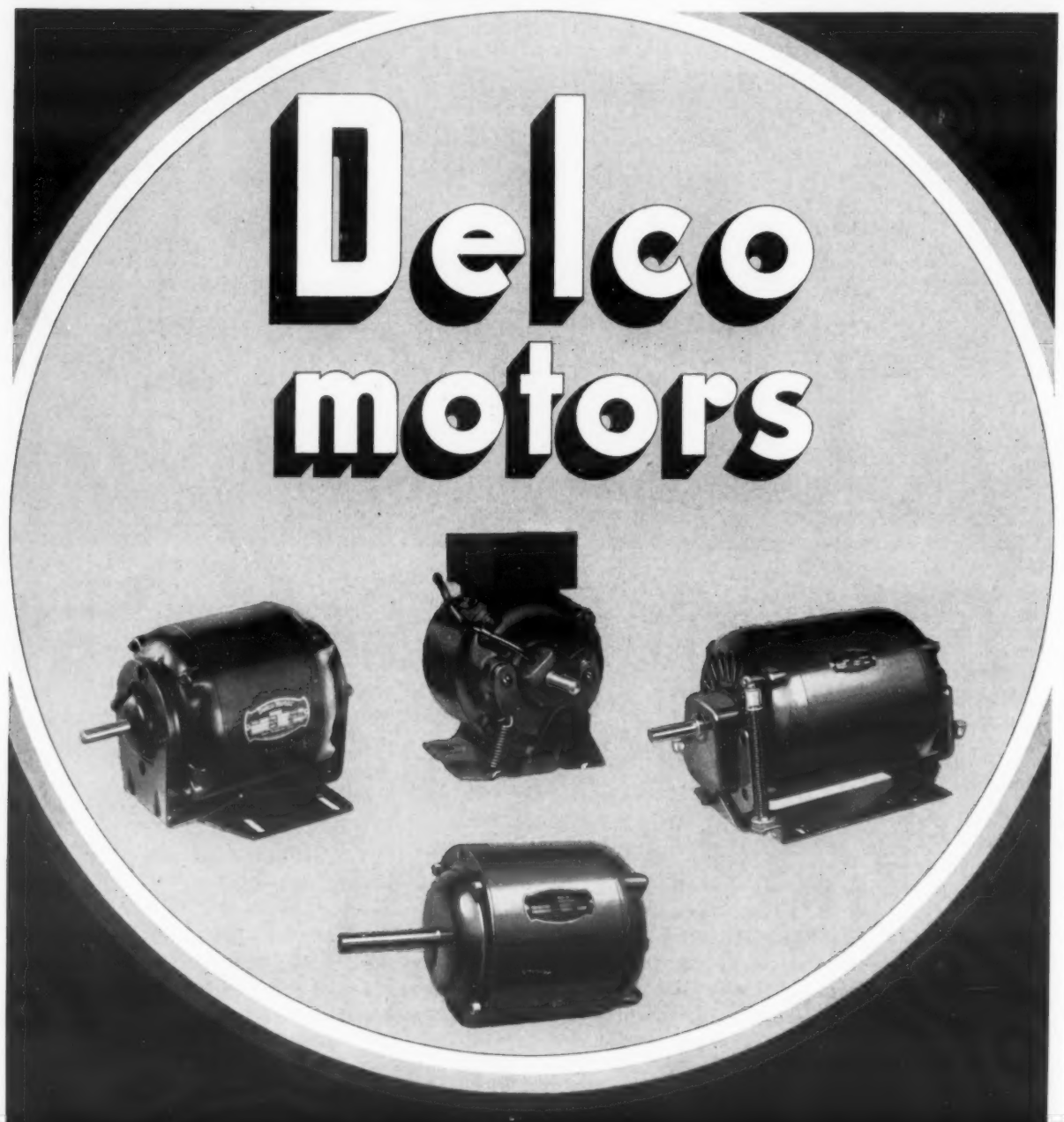


Climax of the editor's sojourn in Sydney was a week-end of deep sea fishing at Jervis Bay, the Riviera of Australia. Arranged by Frank Hansen, managing director of F. C. Lovelock, Ltd., the affair was attended by a number of Sydney refrigeration leaders. Left picture shows Mr. Foley, whom the editor dubs "mine host"; Bert Yeats, and George Harris, managing director of Harris Hutchinson & Co., Ltd., Sydney cabinet manufacturer. At the right are several members of the party, ready to start their day's sport.

Scenes in Two Cities



(1) Scott Hotel, Melbourne, scene of the banquet given George Taubeneck by leading refrigeration manufacturers and distributors of the city. (2) Joe Schartl, technical director of Electricity Meter Mfg. Co., Sydney, makes one of the city's pet kangaroos beg for a sweetmeat.



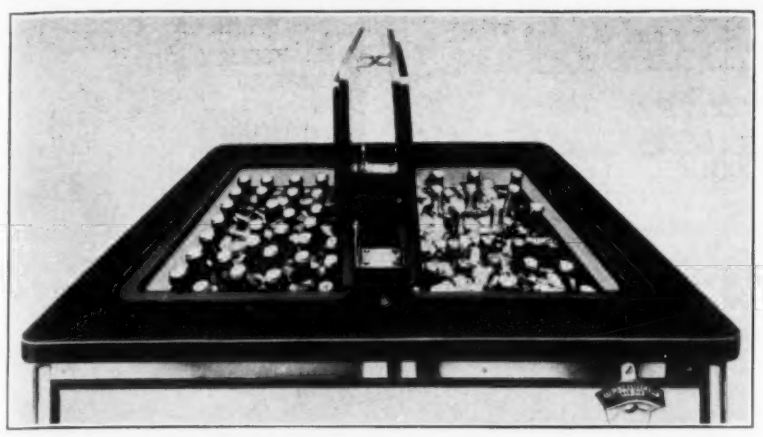
More and more, household appliance manufacturers are standardizing on Delco motors. Dealers, too, prefer them—because they feel that Delco quality and Delco acceptance result not only in performance satisfaction for the maximum length of time, but in easier, quicker sales. The Delco motor, by its *quietness* and dependability, definitely improves the value of any product of which it becomes an integral part.

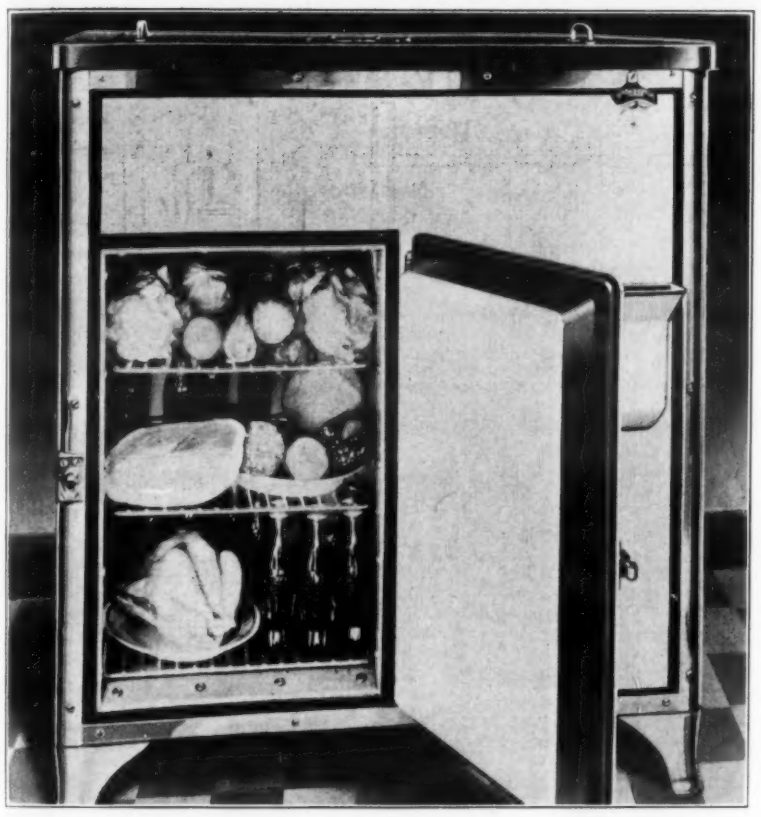
DELCO PRODUCTS CORPORATION DAYTON OHIO

In Canada: McKinnon Industries, Ltd., St. Catharines, Ontario

Commercial Uses

Double-Purpose Cooler





Eagle Foundry Co.'s new Duo-Cooler has space for both beverage and food storage. Above: One-piece moulded hard rubber top, with doors of the same material. Below: The 4½-cu. ft. food storage compartment may also be used for the pre-cooling of bottled goods.

McCORD Refrigeration PRODUCTS
COMMERCIAL EVAPORATORS
DOMESTIC EVAPORATORS
CONDENSERS
METLFLEX ICE TRAYS
SPIRAL FINNED TUBING
AIR CONDITIONING SURFACE
McCORD RADIATOR & MFG. CO.-DETROIT

* * *

New Cooler Has Bottle & Food Storage Sections

BELLEVILLE, Ill.—Just introduced by Eagle Foundry Co. here is the Duo-Cold cooler, a double-purpose unit designed especially for use by the retailer of bottled beverages.

The Duo-Cold unit has two compartments, bottom one of which has a capacity of 4½ cu. ft. and is intended for food storage and dry precooling of bottled goods. The upper section, divided into two refrigerated water compartments suitable for either wet or dry storage, has space for 48 short and 42 tall beverage bottles. Thermostatic control insures proper cooling temperature at all times.

Feature of the unit's construction is its one-piece moulded black hard rubber top, with two lift-doors of the same material, supplied by B. F. Goodrich Co., Akron, Ohio. This top, the manufacturer claims, is not subject to rust or corrosion, will not chip, eliminates metal-to-metal contacts, offers higher insulating qualities, and gives a rich appearance.

Remainder of the cabinet is of welded steel construction, finished with a durable vitreous enamel, with heavy chromium plated trimming and hardware.

Warren Distributorship Opens in Baltimore

BALTIMORE—Warren Refrigerator Co. was recently organized here as a Maryland corporation to distribute Warren refrigerated display cases and cabinets. Local operations have been opened at 609 N. Eutaw St.

Capital of the concern has been placed at $50,000.

Eisler's to Handle Lipman Line in New Jersey City

NEW BRUNSWICK, N. J.—Eisler's Inc., of this city, was recently appointed Lipman distributor in the territory adjacent to New Brunswick, reports D. G. Fifield, sales promotion manager of General Refrigeration Sales Co.

Kelvinator Answers Question on Proper Number of Salesmen

DETROIT—How many prospects for commercial refrigeration are there per 1,000 population, on the average, and how many prospects are necessary to support a full-time commercial refrigeration salesman?

This question, which commercial distributors and dealers often ask themselves, is given a general answer in the 1936 plan book on Kelvinator commercial equipment.

Two general rules, based on the experience of Kelvinator commercial dealers are presented as follows:

1. In the average community there are approximately 21 potential commercial refrigerator prospects for every 1,000 of population.

2. Five hundred commercial prospects will support a salesman of average ability and yield him a satisfactory income.

Thus, the dealer or distributor should have one full-time salesman for every 23,000 or 24,000 population, the Kelvinator plan-book advises.

Following is a table of manpower which Kelvinator recommends:

No. of Prospects	Full-Time Commercial Salesmen	Combination Domestic & Commercial Salesmen
Up to 250	None	1
250 to 500	None	2
500 to 750	1	None
750 to 1,000	1	1
1,000 to 1,500	2	None
1,500 to 2,000	2	None

It is also recommended in the plan book that where five or more commercial salesmen are needd to cover the market, their work should be supervised by a commercial salesmanager who can devote his full time and energy to the job.

G-E Issues Data on Farm Milk Cooling

CLEVELAND—High bacteria count too often robs the dairyman of his profit, is the warning contained in General Electric's new guide book on modern electric refrigeration for farm use, issued as a part of the company's campaign to feature the latest electrical aids to good farming.

Walter E. Landmesser, manager of commercial refrigeration of G-E's appliance and merchandise department, reports that widespread advertising and merchandising efforts will spotlight farm refrigeration throughout the summer. Particular stress will be laid on the dairy farmer's need for refrigeration.

"The temperature of milk and cream must be constantly controlled by proper cooling methods before the farmer can expect to get all the dairy profits coming to him," Mr. Landmesser states. "Whatever cooling is used, it must cool within two hours or less to below 50° F. and then hold the milk below 50° F."

The new G-E machines, he says, will automatically operate to bring the temperature down to 36° every time it increases to 40° F.

Using a wet-storage milk cooler, milk at 95° as drawn from the cow will cool to below 50° in 1½ to 2 hours, Mr. Landmesser declares. Where faster cooling is required, an agitator in the water bath speeds the process.

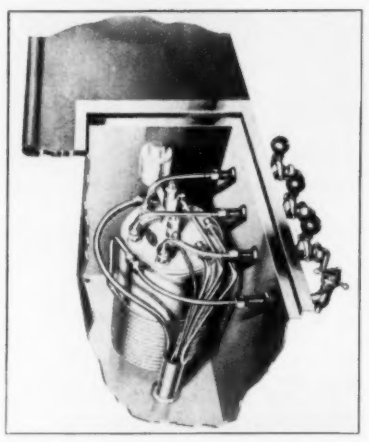
A third method of milk cooling can be utilized where cold spring or well water is available. The milk may be pre-cooled over an aerator through which the cold spring or well water is circulated. With 65° F. well or spring water, milk would be cooled over the aerator to about 70° F., which is one-half of the cooling required, Mr. Landmesser reports. The milk is then stored in the milk cooler tank for the further cooling necessary to pull it down below 50° F. and hold it there.

In dry-storage milk cooling, a refrigerated brine bath is circulated through the aerator over which the milk is cooled. One or two dry-storage compartments are available for storing the cooled milk in cans or bottles in crates. The walls of the brine tank refrigerate the dry storage compartments. G-E claims its dry storage milk-cooling equipment is ideal for milk producers who bottle their own milk and sell direct to retailer and consumer.

The G-E method of cooling milk and cream and storing in a "walk-in" cooler is approximately the same as that of its cabinet type dry storage cooler, Mr. Landmesser explains. Brine is circulated through an aerator over which the milk is cooled. The "walk-in" cooler is then used for storing the cooled milk and cream in cabinets and bottles.

Free survey service is offered by the company to the farmer who wishes to find out quickly and easily what it would cost to put in modern electric refrigeration on his farm.

Properly Installed



Pictured above is a model installation of a Temprite beer cooler for three different types of beer and one water tap. Temprite officials point out that a salient feature is the use of the shortest possible connecting lines from the cooler to the taps, avoiding all kinks and bends. The lines bringing the beer from the keg come up through a single conduit, which should be insulated. The water line is coiled around the cooler, with a short connecting link to the tap. The compartment is waterproofed and has a drain, so that it may be easily cleaned by dousing a pail of water over the whole assembly.

Latest Puro Filter Model Featured by Use of Pre-Cooler

NEW YORK CITY—Puro Filter Corp. has added to its line of water cooling equipment this year a new cooler, designated as model NTB-48, of the top bubbler type, having a capacity of 4 to 8 gallons of water per hour with a 30° F. drop in tap water temperature.

The cooler has a direct connection with the water supply, refrigeration high side of ⅛ hp. capacity being located in the bottom compartment. In the upper compartment is a specially designed low side instantaneous cooler, with additional space for the Puro Filter-Purifier, which removes all color, taste, odor, and foreign matter from tap water.

A pre-cooler of special design is also housed in the cooler's upper compartment, and is constructed so as to prevent clogging. Any refuse dropped down the drain will run into the pre-cooler, but may be removed easily without disconnecting the equipment.

This pre-cooler, it is claimed, has a very rapid heat transfer, due to a maximum amount of surface in the baffles. All surfaces in contact with the water are heavily tinned, to prevent contamination.

Top of the cooler is constructed of vitreous china, easily cleaned. Cabinet is finished in baked enamel.

Refrigeration and Air Conditioning Supplies

MELCHIOR ARMSTRONG DESSAU CO. MACO NEW YORK

Melco Refrigeration Catalog No. 6 Now Ready . . . Most complete issue ever published. We are now carrying larger and more varied stocks than ever before in each of the following warehouses:

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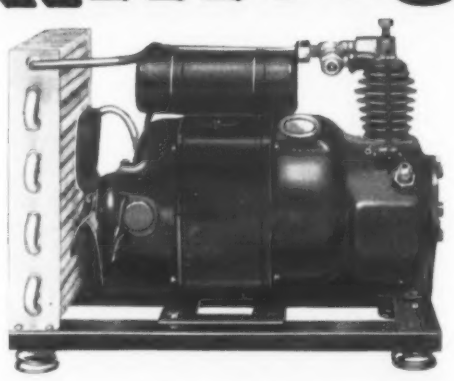
KELLOGG



Dependable is the Word . . .

Whether your demand for household electric refrigeration condensing units is for original installation or for the replacement of units of other makes, it will pay you to investigate the new, light, compact, vibrationless Kellogg Highside.

After four years of experience with these units, we can safely assure you of more refrigeration for less current consumption than you have been taught to expect from a 1/6 H.P. unit.

It is small enough to fit into the compressor compartment of almost any domestic refrigerator box.

Kellogg can also supply commercial sizes from 1/4 to 5 H.P.

Write for your copy of the new Kellogg catalog and price list before you place your next order for highsides.

KELLOGG COMPRESSOR AND MANUFACTURING CORPORATION

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The Buyer's Guide

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Write for bulletin on complete line covering refrigerating appliances, liquid line filters, dehydrators, acid neutralizers, standard parts and materials, service tools, shaft seals, bearing metals and parts. Descriptive literature will be gladly furnished on any or all of these lines on request.

AMERICAN INJECTOR COMPANY 1481-14th. Street, Detroit, Mich.

For quick replacements and satisfied customers—

Recommend RANCOSTAT —with Confidence
Rancostat is the simplest, strongest, most dependable control unit ever built for domestic refrigerators. 30 Replacement models—all easily installed. Write today for new Bulletin—No. 655.
The Automatic Reclosing Circuit Breaker Co. Columbus, Ohio

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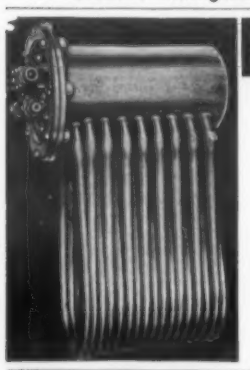
We offer a binder designed and made especially for keeping your file copies of Electric Refrigeration News neat and always available for ready reference.

It is made of stiff board covers, attractively bound in good quality of black imitation leather. The name Electric Refrigeration News is stamped in gold on the front cover and backbone.

The price is $3.75 shipped to you postpaid in the United States and Possessions and Pan-American Postal Union countries. For all Foreign countries postage based on a shipping weight of 6 pounds must be added to this price. Send your remittance with order. May we send you one?

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.



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. . . . in the fine art of recalibration of float valves and the silver soldering of evaporation coils . . . for all makes of Ice Cream Cabinets.
WE MANUFACTURE AND REPLACE . . . Monel Tops • Enamel Panels • Tanks • Rims and Rim Sleeves . . . all other parts for all make cabinets.

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A Division of Standard Body Corp.
430 E. 104th Street, New York
Write for Details

Refrigeration Instruments by Marsh

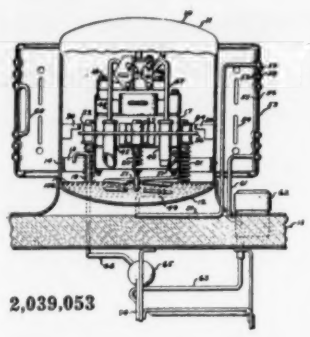
MARSH REFRIGERATION DIAL THERMOMETERS are suitable for every type of installation and application.

They are manufactured in several sizes and are available in a wide variety of temperature ranges either with Fahrenheit or Centrigrade scales. These instruments are constructed with self-contained bulb or in distant reading construction with connecting capillary tubing and bulb.

The self-contained instruments are available in straight form, angle form or oblique.

All Marsh dial thermometers are constructed with adjustment feature permitting positive calibration of the instrument in the plant, laboratory or instrument department without removing mechanism from case.

Jas. P. Marsh Corporation
2067 SOUTHPORT AVE., CHICAGO, ILL.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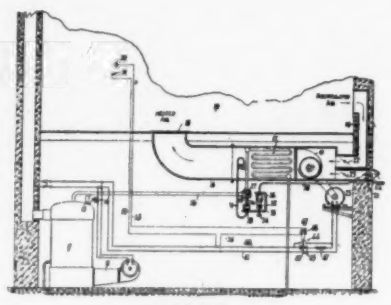
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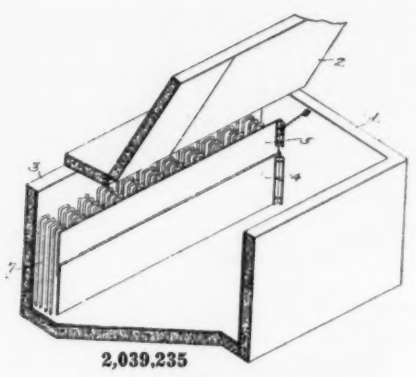
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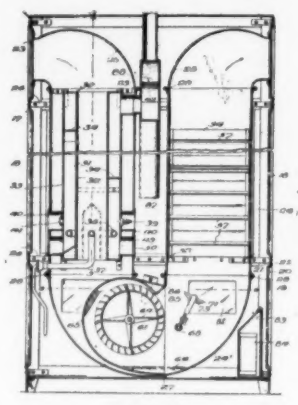
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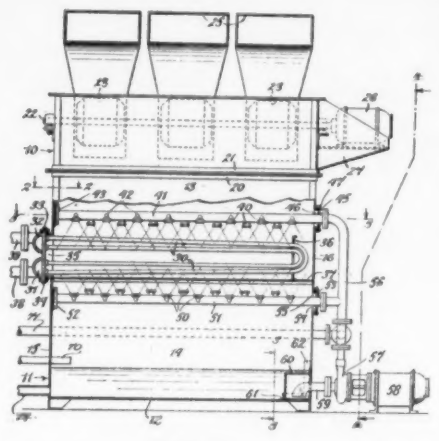
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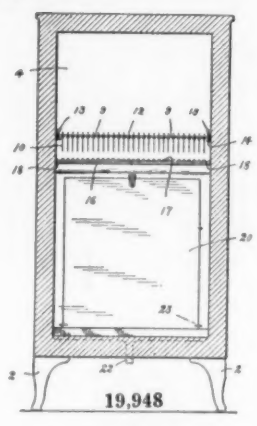
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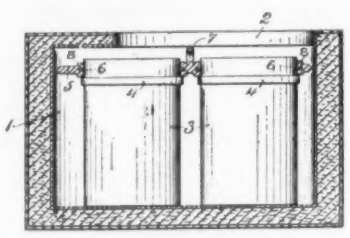
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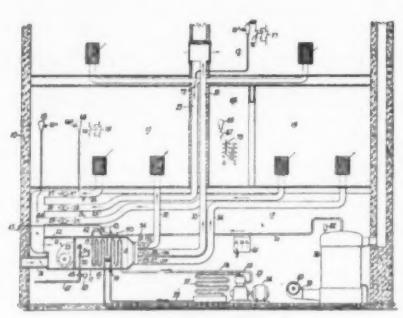
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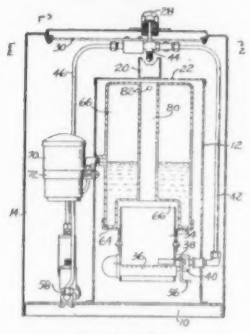
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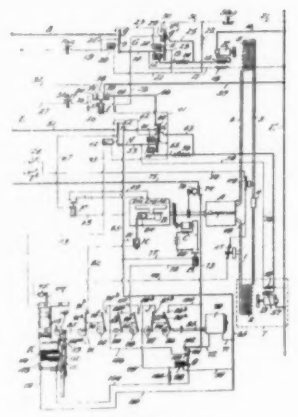
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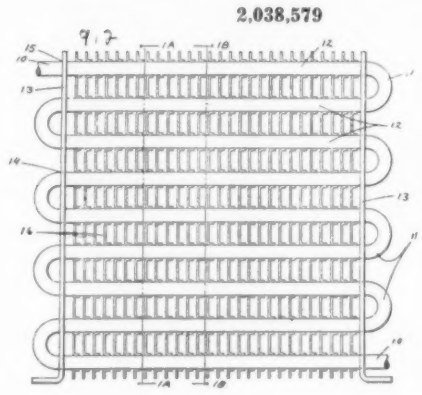
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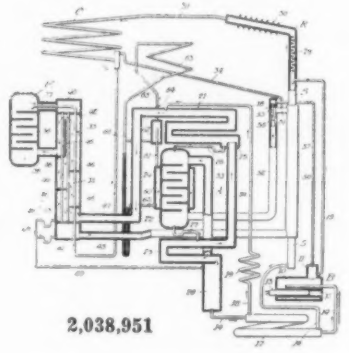
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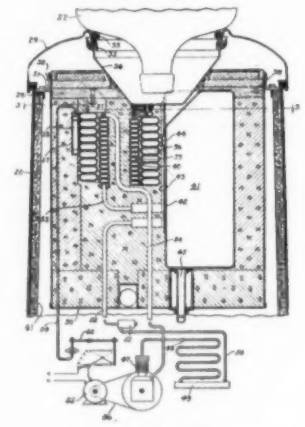
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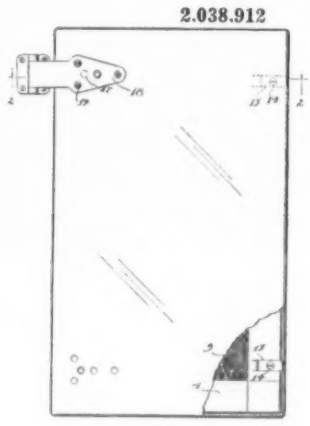
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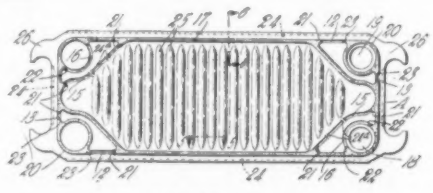
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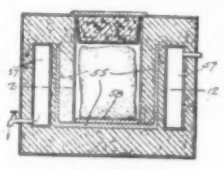
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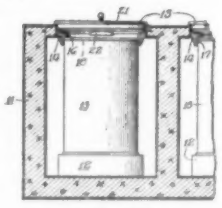
2,038,990

Patents

Issued April 28, 1936

2,038,536. SPRAY COOLER. Claude A. Bulkeley, New York, N. Y., assignor to Niagara Blower Company, New York, N. Y., a corporation of New York. Application August 28, 1933, Serial No. 687,032. 11 Claims. (Cl. 261—11.)

2,038,578. AIR CONDITIONING APPARATUS. John F. Lamb, Pittsburgh, Pa., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania. Application January 20, 1934, Serial No. 707,539. 5 Claims. (Cl. 237—2.)

2,038,579. AIR CONDITIONING SYSTEM. John F. Lamb, Pittsburgh, Pa., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania. Application January 20, 1934, Serial No. 707,540. 27 Claims. (Cl. 257—3.)

2,038,634. REFRIGERATOR DOOR. Gebhard C. Bohn, St. Paul, Minn., assignor to The Bohn Company, St. Paul, Minn., a corporation of Minnesota. Application April 14, 1928, Serial No. 270,014. 4 Claims. (Cl. 20—35.)

2,038,654. AIR CONDITIONER. Dore W. Grazier, Johnstown, Pa. Application Nov. 29, 1932, Serial No. 644,890. 3 Claims. (Cl. 257—9.)

2,038,773. HUMIDIFIER. Earl L. Tornquist, Elmhurst, Ill. Application May 27, 1935, Serial No. 23,553. 12 Claims. (Cl. 126—350.)

2,038,912. REFRIGERATING APPARATUS. Otto M. Summers, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corporation, a corporation of Delaware. Application April 4, 1930, Serial No. 441,463. Renewed September 28, 1934. 12 Claims. (Cl. 257—252.)

2,038,951. ABSORPTION REFRIGERATION. Rudolph S. Nelson, Rockford, Ill., assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio. Application May 23, 1931, Serial No. 539,450. 6 Claims. (Cl. 62—119.5.)

2,038,989. REFRIGERATION APPARATUS. Ralph F. Castle, Kansas City, Mo., assignor, by mesne assignments, to Sealzit Corporation, a corporation of Illinois. Application July 20, 1933, Serial No. 681,292. 2 Claims. (Cl. 220—85.)

2,038,990. SEALING DEVICE FOR REFRIGERATING APPARATUS. Charles O. Barr, Chicago, Ill., assignor to Sealzit Corporation, Chicago, Ill., a corporation of Illinois. Application June 30, 1934, Serial No. 733,211. 6 Claims. (Cl. 220—14.)

2,039,053. REFRIGERATING MACHINE. Harley H. Bixler, Schenctady, N. Y., assignor to General Electric Company, a corporation of New York. Original application January 11, 1935, Serial No. 1,337. Divided and this application June 15, 1935, Serial No. 26,797. 6 Claims. (Cl. 62—115.)

2,039,188. REFRIGERATING APPARATUS. Donald H. Reeves, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corporation, a corporation of Delaware. Application May 29, 1931, Serial No. 541,012. 12 Claims. (Cl. 62—141.)

2,039,216. PLATE HEAT EXCHANGER. Harvey Feldmeier, Little Falls, N. Y., assignor to Cherry-Burrell Corporation, Wilmington, Del., Application August 16, 1935, Serial No. 36,529. 9 Claims. (Cl. 257—245.)

2,039,235. MILK COOLING APPARATUS. Richard Markley, Jr., Malvern, Pa. Application November 8, 1934, Serial No. 752,161. 3 Claims. (Cl. 62—101.)

2,039,240. AIR COOLING SYSTEM FOR VEHICLES. Joseph F. Frese, Baltimore, Md., assignor to Monitor Controller Company, Baltimore, Md., a corporation of Maryland. Original application July 25, 1932, Serial No. 624,594. Divided and this application October 6, 1934, Serial No. 747,236. 7 Claims. (Cl. 62—4.)

19,948. REFRIGERATOR. Martin Hokanson, Duluth, Minn., assignor to Eidco, Inc., Duluth, Minn., a corporation of Minnesota. Original No. 1,961,361, dated June 5, 1934, Serial No. 523,782, March 19, 1931. Application for reissue April 20, 1935, Serial No. 17,549. 23 Claims. (Cl. 62—46.)

19,950. METHOD AND APPARATUS FOR REFRIGERATION. Edward Rice, Jr., New York, N. Y., assignor to International Carbonic, Inc., Wilmington, Del., a corporation of Delaware. Original application July 14, 1930, Serial No. 467,999. Divided and this application August 23, 1934, Serial No. 741,465, Patent No. 1,992,889, dated February 26, 1935. Application for reissue March 7, 1936, Serial No. 67,738. 28 Claims. (Cl. 62—81.5.)

17 Kelvinator Dealers in W. Virginia Employ Home Service Plan

CLARKSBURG, W. Va.—Seventeen dealers of the Williams Distributing Co., Kelvinator distributor here, recently added home economists to their sales staffs as a result of the efforts of Mrs. Betty Garrett, home economist of the distributorship, who first convinced dealers of the advisability of the plan, and then conducted two training schools for the home service workers.

This activity was instigated to provide a means of instructing new purchasers in the use, convenience, and economy of their electric refrigerators, because, Mrs. Garrett claims, she found in her field contact work that most users actually knew very little about these factors.

"I believed that this service would make new purchasers enthusiastic users and sales boosters, and that the dealers would be repaid for hiring home economists in the elimination of service calls, creation of good will, and the securing of new prospect names and sales from users."

Working from this basis, Mrs. Garrett contacted the company's dealers, 17 of whom agreed to hire home economists. She then conducted two two-day training schools to familarize the new workers with company sales methods.

Attending the first school, held in Clarksburg, were: Mrs. Sidrow, General Radio Store, Grafton; Mrs. Roberts, C. C. Keys Co., Clarksburg; Mrs. Cottrill, Watts-Sarter-Lear Co., Clarksburg; Mrs. Davis, Davis Bros., St. Mary's; Mrs. Davis, S. D. Owen, Sisterville; Mrs. Nelle Jones, Poling Undertaking Co., Buckhannon; Miss Peterson, Weston Maytag Co., Weston; Mrs. Richmond and Mrs. Murphy, Murphy Motor Co., Pennsboro.

Others were: Mrs. Reah Carpenter, McCourt Motor Co., Webster Springs; Mrs. Jackson, Chenowith Tire Co., Morgantown.

Mrs. Garrett conducted a second training school at Charleston, W. Va. for the following: Virginia Fauver, Coyle & Richardson, Charleston; Virginia Andrews, Elk Furniture Co., Montgomery; Mrs. Secrist, New River Electric Co., Mt. Hope; Mrs. John Gilbreath, Coyle & Richardson, Charleston; Mrs. L. A. Green, Raleigh Refrigerator & Radio Co., Beckley; Mrs. Calhoun, Evans Hardware & Supply Co., South Charleston.

Dr. Hainsworth Plans European Trip

NEW YORK CITY—Dr. William R. Hainsworth, vice president and director of research for Servel, Inc., will be one of the passengers on the first eastward voyage of the Cunard liner Queen Mary, which is scheduled to sail from New York, June 6.

Upon his arrival in England on June 9, Dr. Hainsworth will visit the Electrolux plant at Luton, near London. He will remain in London sightseeing for several days when he will go to the Hague to attend the Seventh International Refrigeration Congress to be held under the patronage of Queen Wilhelmina. The Congress, which will convene on June 16, is sponsored by the International Institute of Refrigeration of France and the Netherlands Association of Refrigeration.

While abroad, Dr. Hainsworth, noted as a mountain climber who has made first ascents of 20 mountains in the Canadian Rockies, will visit the Alpine country where he expects to engage in his favorite pastime by climbing such famous peaks as Monta Rosa, the highest mountain in Switzerland, and the Matterhorn. He also expects to climb the Grepon, noted for its steep, rocky formation, and Mont Blanc in the French Alps.

From June 23 to July 6, Dr. Hainsworth will be in Sweden where he will visit the factory of the Swedish Electrolux company at Motala, near Stockholm.

Dr. Hainsworth plans to sail for home on the Italian liner *Conte di Savoia* on July 23, after spending ten days in Italy.

Special Trade-in Plans Used to Push Sales of Reconditioned Units

BIRMINGHAM, Ala.—To move electric refrigerators from its sales-room floor, the Evans Electric Appliances Co. of this city is making the following offer: purchasers may trade the reconditioned units in within a year on new boxes, and receive a full cash allowance of all they have paid.

"This plan convinces customers of our faith in values offered in the used refrigerators, and at the same time keeps them in line for the purchase of new refrigerators," said J. M. Evans, manager. The plan also enables the concern to offer "free refrigeration for one year with no strings attached."

INFORMAL TALK NUMBER 50

They Learn How You Want It Done Then They Do It In Our Shops

When you employ an R-A-C-I Trained man for installation and service work, you get a fellow who has spent over 600 hours learning what you want done and how to do it. After he satisfied us that he knew what it was all about, we paid his fare to Chicago. Then we gave him 100 hours of practical experience on actual apparatus under competent instructors.

The result is, you get a man with experience, thoroughly trained for profitable service, under the supervision of industry-appointed engineers—a man whose training has been endorsed by thirty leading manufacturers—a fellow you can bank and build on.

Write for details. No obligation.

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The Officially Endorsed School

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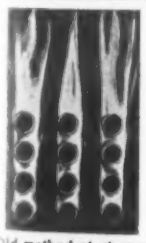
WATER COOLERS
STORAGE ● SHELL & TUBE
BROOKLYN, N. Y.



Old method of placing tubes "in line"

STAGGERED TUBES
arranged within the fin, improving turbulence and heat transfer efficiency, with **all-copper fused fin to tube bond.**
Kramer Refrigeration Products are finished in electro tin plating.
Catalog No. 336 is the most complete ever published. Have you a copy?

Staggered Arrangement

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MANHATTAN V-BELTS

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Long service records are assured when you use Manhattan V-Belts because their exclusive construction - - a single layer endless whipcord section completely floated in rubber to hold together and cushion each cord in the whipcord strength member - - minimizes structural breakdown. Thus greatly increased belt life results. For more efficient performance and to eliminate noise - - specify Manhattan V-Belts.

THE MANHATTAN RUBBER MFG. DIVISION
of Raybestos-Manhattan, Inc.
45 Townsend Street Passaic, N. J.

Questions

Milk Refrigeration Tests

No. 2759 (Distributor, New York)—"Starting a promotion showing how long milk can be kept sweet in electric refrigerator in dealer window. Health department testing daily. Have you any reports of similar promotions? Will appreciate any suggestions you can offer."

Answer: In a 1931 issue, ELECTRIC REFRIGERATION NEWS reports the story of a dealer who offered a refrigerator as a prize in contest to the person determining most accurately how long milk would stay fresh. Daily tests were conducted by the health department. Participants were required to fill out a registration card stating age, occupation, and whether they owned a refrigerator and what make. The milk stayed fresh 14 days, 17 hours, and 25 minutes.

Detroit Ordinance

No. 2760 (Serviceman, Michigan)—"Will you please furnish me with Detroit city clerk's name and address, as I wish to receive city of Detroit ordinance and information as to who is examiner for licensing refrigeration engineers."

Answer: Richard Reading is the Detroit City Clerk with offices in the City Hall.

The Detroit refrigeration ordinance was published in the April 29, 1936, issue of ELECTRIC REFRIGERATION NEWS.

Air-Conditioning Firms

No. 2761 (Real Estate Firm, Oklahoma)—"I am planning on the sale and installation of air conditioning equipment, especially for homes already constructed. I would appreciate very much your furnishing me a list of your advertisers manufacturing this kind of equipment.

Answer: See below.

No. 2762 (Distributor, Pennsylvania)—"Kindly give us a list of manufacturers of some of the most popular makes of self-contained air-conditioning units."

Answer: Specifications of current models of self-contained floor type conditioners that include a cooling function are listed in this issue.

1936 Specifications

No. 2763 (Dealer, New York)—"Will you kindly send me an issue of ELECTRIC REFRIGERATION NEWS containing the specifications of 1936 refrigerators such as were contained in last year's issue of June 12, 1935, also any issue of book containing the manufacturers of trays, accessories, and electrical refrigerator parts and equipment such as floats, etc.

"Can you also give me the address of the Mullins Co., makers of Mullins evaporators? Whatever charge for this information kindly send bill with papers."

Answer: The 1935 REFRIGERATION AND MARKET DATA BOOK lists all manufacturers of household and commercial refrigerators and air conditioning equipment, as well as refrigerator parts, supplies and accessories. This book is divided into four sections:

(1) alphabetic list of manufacturers; (2) index of trade names; (3) classified list of refrigeration equipment; (4) geographical directory giving name, address, telephone number, products, and executive personnel of the various manufacturers. Also included is a separate section listing independent service companies of which we have a record, and jobbers of supplies, parts, and materials.

Mullins Mfg. Co. is located on South Ellsworth Ave., Salem, Ohio.

Data on City Codes

No. 2764 (Manufacturer, Wisconsin)—"A customer of ours has inquired as to the regulations in various cities throughout the country on sulphur dioxide. Of course, we have a lot of this information on different cities, but when it comes to covering the whole country and to being really specific we find we do not have the information requested.

"Will you please advise whether you know of any published article that attempts to cover this information."

Answer: We publish codes and ordinances of the principal cities as they are made public, but have published nothing that would be comprehensive enough to answer your customer's request.

Compressor Information

No. 2765 (Manufacturer, France)—"We are interested in enclosed compressors working with SO_2; can you supply us with information about the motors used in such systems, particularly the electric materials necessary for a good electric insulation of the motor coils."

Answer: Manufacturers of insulation materials suitable for above described application are invited to furnish information. Name of inquirer on request.

Association Members

No. 2766 (Manufacturer, Illinois)—"Having subscribed to your ELECTRIC REFRIGERATION NEWS for many years, we would appreciate if you will let us have the following information.

"Not very long ago, we believe it was last fall, an association was formed comprising refrigeration and air conditioning equipment manufacturers as well as wholesalers. We would like to have their complete names and addresses, and if possible a membership roster of both associations. We wonder whether you can furnish us with this material."

Answer: These factors of the industry are represented by three associations: The Refrigeration Division of the National Electrical Manufacturers Association (Nema), 1106 Penobscot Bldg., Detroit, Mich., with Mr. Haldeman Finnie as manager; the Air Conditioning Manufacturers Association, Southern Bldg., Washington, D. C., William B. Henderson, executive vice president; and the Refrigeration Supplies and Part Manufacturers Association, Mr. Frank Gleason, secretary, David Stott Bldg., Detroit, Mich.

The following manufacturers are members of the Nema Refrigeration Division:

Apex Electrical Mfg. Co.
Cleveland, Ohio.
Crosley Radio Corp.
Cincinnati, Ohio.
Fairbanks-Morse Home Appliances, Inc.
Indianapolis, Ind.
Frigidaire Corp., Dayton, Ohio.
General Electric Co.
Nela Park, Cleveland, Ohio
Gibson Electric Refrigeration Corp.
Greenville, Mich.
Jomoco, Inc., Waukegan, Ill.
Kelvinator Corp., Detroit, Mich.
Leonard Refrigerator Co.
Detroit, Mich.
Merchant & Evans
Philadelphia, Pa.
Norge Corp., Detroit, Mich.
Potter Refrigerator Corp.
Buffalo, N. Y.
Servel, Inc., Evansville, Ind.
Sparks-Withington Co., Jackson, Mich.
Stewart-Warner Corp., Chicago, Ill.
Sunbeam Electric Mfg. Co.
Evansville, Ind.
Uniflow Mfg. Co., Erie, Pa.
Universal Cooler Corp., Detroit, Mich.
Westinghouse Electric & Mfg. Co.
Mansfield, Ohio.

Members of the Air Conditioning Manufacturers Association include:
Baker Ice Machine Co., Omaha, Neb.
Carrier Engineering Corp., Newark, N. J.
De La Vergne Engine Co.
Philadelphia, Pa.
Frigidaire Corp., Dayton, Ohio.
General Electric Co., Cleveland, Ohio
Kelvinator Corp., Detroit, Mich.
J. J. Nesbitt, Inc., Philadelphia, Pa.
Parks-Cramer Co., Fitchburg, Mass.
B. F. Sturtevant Co., Hyde Park, Mass.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.
York Ice Machinery Corp., York, Pa.

The Refrigeration Supplies and Parts Manufacturers Association was formed last fall in Detroit, the story of which was published in the Oct. 30 issue of ELECTRIC REFRIGERATION NEWS. Frank J. Gleason is executive secretary of the association with offices at 2707 David Stott Building, Detroit.

Formed at the same time was the National Refrigeration Supply Jobbers Association. Mr. Gleason is also secretary of this group.

Recipe Books

No. 2767 (Distributor, California)—"Can you advise us where we can secure refrigerator recipe books such as most of the companies issue in their own name. The ones we want should be without any factory binding on them, but similar in printing to those issued by Kelvinator, Frigidaire, etc."

Answer: For information about refrigerator recipe books not prepared by any one particular manufacturer try Borden Kitchen Institute, 350 Madison Ave., New York City.

Operating Costs

No. 2768 (Library, Wisconsin)—"We are anxious to find out the average cost per day, month or year of operating the various electric refrigerators that are on the market.

"We have been unable to find this information in any of our reference material. It has occured to us that you might possibly have this information. If you have and will be good enough to send it to us, your courtesy will be much appreciated.

"If you do not have the information but know where we can secure it that would be helpful."

Answer: The only source of information on the cost of operating various refrigerators that we know is the article describing tests conducted on various electric refrigerators by Professor Royce E. Johnson of the University of Wisconsin, which was published in the March 25 issue of ELECTRIC REFRIGERATION NEWS.

Though this article does not give the names of the refrigerators tested nor the actual cost of operation, it does give all the characteristics of each refrigerator tested, and the current consumption and temperatures maintained under various conditions.

There Is No National Association of Dealers

No. 2768 (Manufacturer, Connecticut)—"What is the date of the next meeting of the National Association of Refrigeration Dealers?"

Answer: There is no "National Association of Refrigeration Dealers."

Information Wanted

Information is desired regarding Deodaire Inc., formerly at 540 N. Michigan Ave., Chicago, Ill. No longer at this address and mail has been returned unclaimed.

Important

TO MANUFACTURERS OF DISPLAY REFRIGERATION EQUIPMENT

The new LOXIT type Ace Hard Rubber Doors are attracting wide attention due to their new and valuable improvements in construction and design. ● It will pay you to investigate LOXIT *at once* as the new doors are now available at no extra cost. Write to

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Send for the New
REFRIGERATION CATALOG
Eight Models of Compressors
Forty-one Models of Highsides
from 1/6 H. P. to 15 H. P.
BRUNNER MANUFACTURING CO.
UTICA, N. Y.

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HEATING, REFRIGERATING AND AIR CONDITIONING CONTROLS
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CUSTOMIZED For Every Phase of Commercial Refrigeration and Air Conditioning
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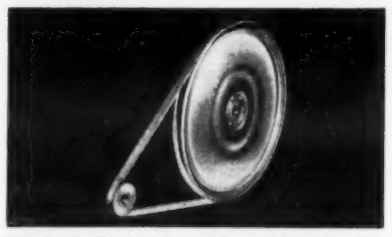
Dayton V-BELTS

● Because of their outstanding advantages Dayton V-Belts have been used as original equipment on leading makes of air conditioning equipment, electric refrigerators, washing machines and other appliances for many years.

Dayton V-Belts are the logical choice because they provide silent, dependable transmission—because their powerful grip prevents slippage—because they run smoothly without weaving, twisting or vibrating.

A nearby distributor carries a complete stock of Dayton V-Belts at all times and can quickly supply you.



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World's Largest Manufacturer of V-Belts

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Thoroughly reinforced all steel attractively finished cabinets.

Complete line of different Models and Capacities.

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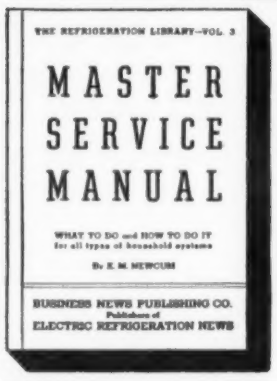
THE REFRIGERATION LIBRARY—VOL. 3
MASTER SERVICE MANUAL
WHAT TO DO and HOW TO DO IT for all types of household systems
By E. M. NEWCUM
BUSINESS NEWS PUBLISHING CO.
Publishers of
ELECTRIC REFRIGERATION NEWS

The Master Service Manual ($3.00 per copy) includes the necessary instructions for servicing all the fundamental types of household systems. Detailed instructions for the servicing of more than a dozen "orphan makes" are also included.

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Combination Price for Both Books, $5.00

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REFRIGERATION and Air Conditioning SPECIFICATIONS
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M & E Parts Co. Lists Accessories Sold

PHILADELPHIA—New catalog just issued by M & E Refrigeration Accessories Co. lists the complete line of refrigeration and air-conditioning supplies and accessories for which the company is wholesaler and distributor. Besides its main warehouse here, the company has a branch office in Lancaster, Pa.

Listed in the catalog is the complete line of tools, dryers, refrigerants, oil, valves and fittings, expansion and solenoid valves, controls, water valves, replacement parts, belts, gaskets, and seals which the company handles.

M & E Refrigeration Accessories Co. is jobber for Imperial tools; Tagliabue indicating and recording thermometers; Taylor and Friez sling psychrometers; Fedders heat interchanger fittings; Mueller Brass Co. valves and fittings; Ranco and Tagliabue thermostats; Penn commercial refrigeration controls; Detroit Lubricator, Minneapolis-Honeywell, and Automatic Products Co. controls; Mayson, Detroit, Aminco, and Fedders automatic expansion valves; Penn and Tagliabue water regulators.

The company also handles Gilmer belts, Rotary Seal refrigerator replacement units, Pedric piston rings, Ohio Carbon Co. motor brushes, door gaskets, replacement gaskets, rubber and aluminum ice trays, evaporators for household units, and Larkin coils and liquid coolers.

137-Page Buyer's Guide Issued by California Refrigerator Co.

SAN FRANCISCO—California Refrigerator Co., jobber of replacement parts, commercial equipment, tools, and accessories for refrigeration, air conditioning and oil burners, has just issued a 137-page "Refrigeration Buyer's Guide," listing its line of supplies for dealers and service men.

In addition to a complete line of replacement parts for household units, the catalog lists tools, bushings, gaskets, seals, door latches and hinges, expansion and solenoid valves, water regulators, pressure valves, refrigerant control valves, room thermostats, and temperature controls.

A section of the catalog is devoted to compressor bodies and complete condensing units, for both household and commercial use. Jomoco household and Brunner commercial units are shown. Century and General Electric motors are also listed.

A feature in connection with this section is a table listing the methods of figuring refrigeration loads for conventional applications in display cases, market coolers, and grocery, hotel, and florist boxes. Outline of the method of determining the proper condensing pressure for various room temperatures is given in another section.

Two pages of the catalog are given over to a description of the ELECTRIC REFRIGERATION NEWS, the MASTER MANUAL, and other publications of BUSINESS NEWS PUBLISHING CO.

California Refrigerator Co., of which Clarence F. (Sandy) Pratt is president, maintains an engineering department, under the direction of Jess E. Rauch, which is at the disposal of dealers and service men in estimating and engineering all types of refrigeration and air-conditioning jobs. Lem V. Branson is sales manager of the company.

WestinghouseDevelops Heavy Duty Motor

EAST PITTSBURGH, Pa.—Especially designed for heavy industrial duty, a new single-phase repulsion-start induction motor, known as the Type CR, has been introduced by Westinghouse Electric & Mfg. Co.

The new CR motor has high starting and pull-in torques, which make it particularly suitable for such applications as pumps, compressors (garage, refrigeration, and other industrial types), machine tools, door openers, automobile lifts, car washers, and grease guns. It is available in a complete line of ratings, from ¾ to 3 hp., 110/220 volts dual voltage for operation on all commercial frequencies.

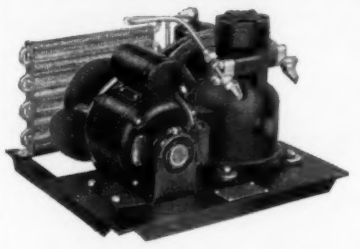
The motor starts as a repulsion motor, and, because of the high torque developed, rapidly overcomes the relatively high inertia to which this type of motor is usually subjected, coming up to speed in a short time. At about 60% of synchronous speed, the armature is short circuited by a centrifugally operated device, and the motor operates as a squirrel cage induction motor. This results in a constant speed, irrespective of the load.

All cast parts of the motor are of heavy section, with shafts and bearings of liberal proportions.

The Buyer's Guide

Suppliers Specializing in Service to the Refrigeration and Air Conditioning Industries

CONDENSING UNITS and COMPRESSORS FOR HOUSEHOLD REFRIGERATION BY



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A SUBSIDIARY OF THE
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CABLE ADDRESS: JOMOCO-WAUKEGAN

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QUALITY-BUILT COMPRESSORS and CONDENSING UNITS

All bearings diamond bored. Positive lubrication of piston by newly developed process plus forced feed lubrication in all models.

Sizes: 1/6, 1/5, 1/4, 1/3 h.p.
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for Commercial Use
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TYLER'S NEW WELDED STEEL REFRIGERATOR CASES

At last a general purpose case at a sensible price. Offers every advantage of the most costly cases at tremendous savings. Modern in every detail. Comes equipped with coils. Single and double duty models.

AN AMAZING VALUE

Hundreds in use. Perfect refrigeration for meat, dairy and delicatessen products and all perishables sold in food stores. Write or wire for all the facts.

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3 INCH INSULATION - TRIPLE GLASS

Complete line of Refrigerators, Display Cases, Store Fixtures. Desirable territory available. Write for particulars.

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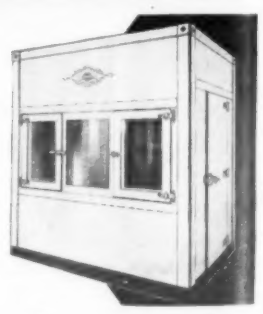

The C. Schmidt Co., Cincinnati

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Believes In
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The Insulation of every Koch fixture is installed thickly and thoroughly. Display cases, for example, have 4-in. thick corkboard insulation. The result is lower operating costs and diminished machine capacity required for refrigeration.
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Write for catalog and sales proposition. Submit references. Some attractive territories still open.
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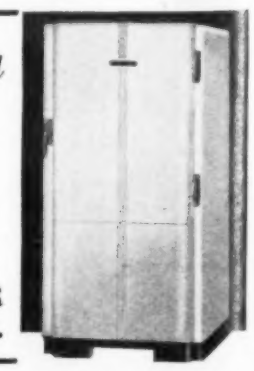


Interviews

By Robert P. Nixon

HASCO of Greensboro, NORTH CAROLINA

The parts jobbing business in the sunny South is *different*—you don't have the usual half dozen competitors in your own local territory. BUT—says Mr. Welker of the Home Appliance Service Co. (a fast-growing jobbing house out on Market Street in Greensboro, N. C.)—you may also not have one independent service company within 50 miles.

And that's just the position Home Appliance Service is in. Greensboro simply doesn't have any independents in the business. Leading distributors and dealers handle practically all of the servicing, according to Mr. Welker. From these groups, and from ice cream companies, HASCO gets the bulk of its localized business.

They buy a substantial amount of replacement parts. And, when they get in a jam on a tough servicing problem they call on HASCO to help with the actual work too. Mr. Welker points out the value of his company's experience in the retail end of the business in years past. On many a tough problem this now counts for a great deal in serving his customers—both with advice and also with actual work on the job when this is needed.

HASCO also gets the call on jobs requiring machine work which service departments and service workers are not prepared to handle. In these cases, Mr. Welker states, the machines are usually broken down and the units brought to HASCO for repair. Renewing valves, refinishing pistons, and regrinding eccentric shafts are among the jobs which keep the wholesale service shop busy.

Featured equipment is the company's line of "CHANGE-OVERS" for modernizing old commercial compressors and converting water-cooled units into the air-cooled type.

These have been fine builders of business from all sections of the country. Usually, states Mr. Welker, the "CHANGE-OVER" order from Seattle, El Paso, or Bangor, Me. will be accompanied by other items on the order list which may be currently needed.

Chief headache is the difficulty of getting out material from the factories fast enough to take care of orders. In the business about six years, HASCO finds '36 showing a continued upswing in business, says Mr. Welker.

Much of the coil business in this section, Mr. Welker comments, is going to Larkin. Speed of delivery is a primary concern of practically every customer, and Larkin's Atlanta location is an advantage in that respect.

Regretted missing Mr. Parker of HASCO, whom we had the pleasure of meeting when the National Parts Jobber's Association was formed in Detroit last fall.

* * *

J. W. Janes

Out at the end of Carolina street Mr. Janes has about completed a new plant for the continuation of his display case production in Greensboro.

It's a small plant, the J. W. Janes Manufacturing Co., but seemingly quite active in production.

Mr. Janes says that he has little trouble with distribution problems. Orders from distributors and dealers all through the East, as well as in the Southeast, are keeping his present production up to capacity, and—"business is good."

He is just now planning a trip through the East to contact customers and prospects, his first outside personal contact of the year. Most business is handled by mail.

Production of cases is confined to one line. This consists of four models, all porcelain outside and in with the exception of the storage compartment—which may be had in either white enamel or plain rust-resisting steel. All models have same height and width (48"x33½") and vary in length from 7 to 12 feet. Corresponding weight variation is 1000 to 2000 pounds.

Other items are product coolers, likewise produced in four standard sizes.

Guarantee is for one year, during which period replacement for unsatisfactory parts will be made free of charge, F. O. B. Greensboro, barring the results of ordinary wear, accident or misuse.

Frigidaire, General Electric and Kelvinator distributors and dealers are best customers. Sales appeal is a low cost case, based on standardization, selling by mail, and no profits to stockholders.—L. W. Janes is sole owner.

* * *

Sorry to find train schedule would not allow a call to see Henry V. Dick in Charlotte, authorized agent for ELECTRIC REFRIGERATION NEWS.

* * *

ATLANTA, GEORGIA

Yancey Bros.

In Atlanta the Yancey Bros. company, at 110 Jackson street, manufactures insulated truck bodies. Not strictly in the refrigeration field, as no units of any kind are installed in the bodies they produce, their production is used primarily by meat packing houses in the Southeastern States.

Cork is standard for floor insulation, Kapok most general for walls and ceiling. Salted meats keep in perfect condition, say Yancey Bros., for any runs up to three or four hundred miles in these insulated bodies.

Typical of the company's output are two insulated bodies nearing completion in the shop, for Swift & Co.

Chief headache for Yancey Bros. is the cut price situation, brought about by intense competition in truck body manufacture.

* * *

W. D Alexander Co.

A Mr. Smith, salesman for the W. D. Alexander Co., Atlanta General Electric Distributor, believes strongly in the telephone canvassing system. For over eight years he has sold refrigerators in and around Atlanta, and working with this method of selling, he has found it more and more successful.

Since the idea of electric refrigeration no longer has to be sold from the ground up, and since the public is to a large extent already completely sold on its advantages, says Mr. Smith, telephone canvassing is a great time saver in ferreting out the prospects—those who either have not yet bought or are now in the market for a new machine to replace their old ones.

He uses the same street-by-street canvass system which is normal in cold canvassing from house to house. A telephone directory of Atlanta classified by street and number addresses costs about $12. Mr. Smith says it would be worth much more than that to just one salesman, even if bought for his own use only.

Most obvious advantage is that non-telephone owners are eliminated. One who doesn't own a telephone would naturally be a poor prospect for an electric refrigerator.

There is no problem in reaching the lady of the house when telephone canvassing, says Mr. Smith. You merely call the number and ask for Mrs. So-and-so. And if she is in, you get her. Very seldom are any questions asked in regard to what you want.

At times he has closed sales without ever seeing the prospect. This is not difficult when the prospect has been persuaded to have a refrigerator sent out for trial.

Normally, however, the telephone method merely separates the prospects from the non-prospects, and does this job in a fourth or even a fifth of the time which cold canvassing would require. A slack period on the floor is ideal for telephone canvassing work, and thus makes time which would otherwise be lost quite valuable in prospect-fiinding.

Even in cases where the party called already has a satisfactory refrigerator, good leads on friends or neighbors can often be obtained.

Check-marks and notations in the address telephone directory provide a convenient record of the canvassing done. Especially because of the ever growing saturation of the market, Mr. Smith believes this system for cold canvassing the most practical yet yet developed.

* * *

Wholesale Radio Service

The Atlanta office of the Wholesale Radio Service Co. is located at 430 W. Peachtree Street. In addition to its radio business, which has been firmly established on a national scale for a number of years, this company also does a large volume in refrigeration parts.

Sales development has been directed primarily toward the radio dealer and service groups, states Mr. Russell, purchasing agent for Wholesale Radio. Having been established in the radio field, the company has promoted its business through former customers and prospects who are now getting into refrigeration servicing. This line of development, says Mr. Russell, is proving very satisfactory.

About 95% of the Atlanta office's business is handled by mail. Customers are located throughout 13 southeastern states, and a few orders come from much more distant points.

Atlanta sales volume is small compared with the out-of-town mail order volume. All local deliveries are made directly over the counter. There are a good number of service men in Atlanta, states Mr. Russell, but practically all of these operate on a very small volume of work.

In addition to the refrigeration parts line, Wholesale Radio also offers a line of household refrigerators under its own brand name of LaFayette. These are manufactured for the company by the Truscon Steel Co. The system used in the LaFayette is very similar to the Copeland unit, says Mr. Russell.

* * *

M. D. Patterson Co.

With a small upstairs office, stock room and shop at 119 Courtland S. E., Atlanta, M. D. Patterson Co., Inc. operates a parts jobbing business based primarily on trade from dairies and ice cream companies in Georgia and surrounding states.

Though this company's location is certainly far from impressive, competitors credit it with a sizable volume of business.

In the absence of the manager, Dan Bowen, former Duke University student of our acquaintance, is in charge of the sales office.

Two 1-inch thick parts catalogs, Frigidaire and Kelvinator, are on the desk and table respectively. Rather well worn, they indicate the source of a substantial percentage of the Patterson company's parts and supplies. Mr. Bowen affirms this.

Mueller Brass, Imperial Brass, and Victor Gasket are among the lines which are stocked. In addition to Gilmer belts, M. D. Patterson carries a line produced by an Atlanta manufacturer, the Holfast Co.

* * *

Tull Metal Supply Co.

J. M. Tull Metal Supply Co., large hardware jobber at 285 Marietta St., Atlanta, handles several refrigeration parts lines.

According to Mr. McGarrity, of the Tull sales organization, the company gets a nice volume of business from local refrigeration distributors, dealers, and servicemen. Out of town business is practically all within the state.

Best volume of trade is from the leading Atlanta refrigeration sales outlets, says Mr. McGarrity. The Georgia Power Company (General Electric and Kelvinator) and Advanced Refrigeration, Inc., (Frigidaire) are among their good customers.

Independent service companies are more numerous on the customer list, but their orders call for very much smaller quantities.

The company maintains a local delivery service by truck. Distributor orders generally call for delivery. Independents usually call at the counter for the parts and supplies they need.

Kerotest fittings, Gates belts, American Brass tubing and a limited range of Imperial and Bonney tools make up Tull's refrigeration stock. The company also sells general tools from several other hardware lines to the refrigeration trade.

* * *

Larkin Corp.

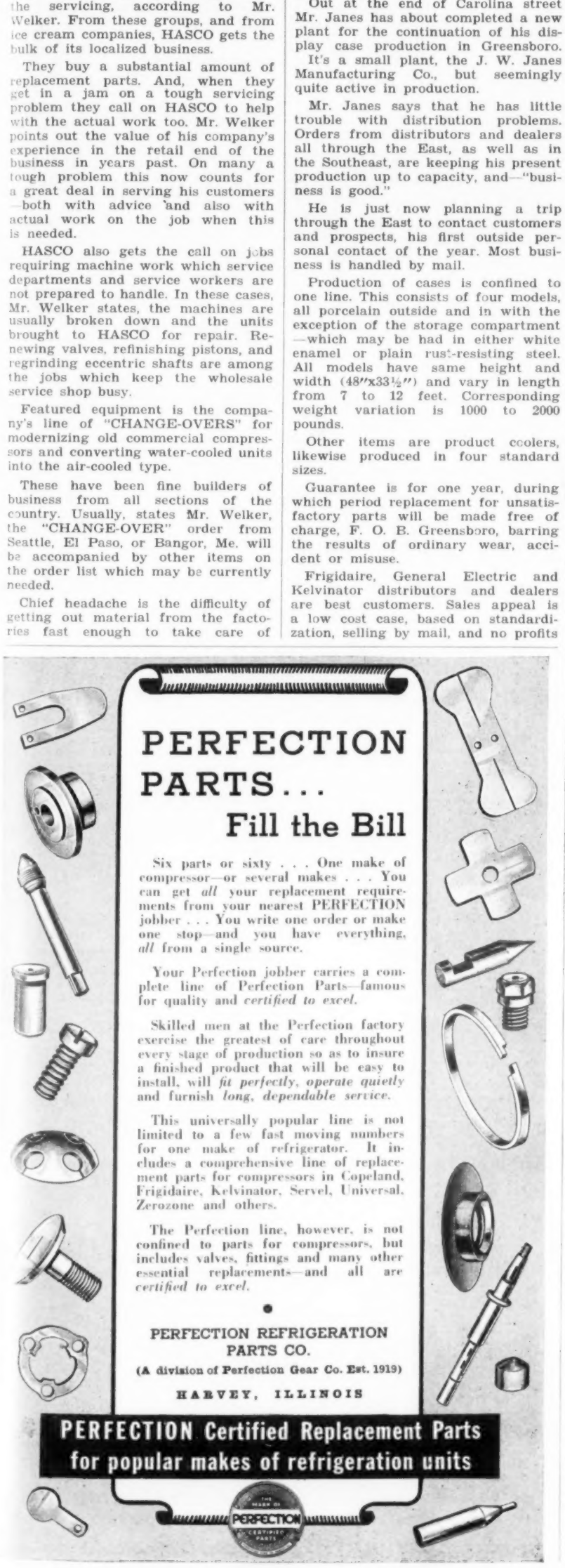
L. U. Larkin, vice president and general manager, reports a substantial upswing in the coil business for Larkin Refrigerating Corp., with main offices in Atlanta.

The past year has more than doubled the sales record of the previous one. New York and Chicago factories have shown exceptionally fine progress.

Of prime importance in the coil field, says Mr. Larkin, is speed in delivery. The company produces more than 700 catalogued coils to meet the wide range of sizes and designs which the business requires.

Even with this wide selection, however, approximately 20% of orders are filled to specifications outside the regular lines.

With increasing business, Larkin is now expanding its production facilities, and plans to change soon to a three-shift basis, in place of the present two shifts.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Fill the Bill
Six parts or sixty . . . One make of compressor—or several makes . . . You can get all your replacement requirements from your nearest PERFECTION jobber . . . You write one order or make one stop—and you have everything, all from a single source.
Your Perfection jobber carries a complete line of Perfection Parts—famous for quality and certified to excel.
Skilled men at the Perfection factory exercise the greatest of care throughout every stage of production so as to insure a finished product that will be easy to install, will fit perfectly, operate quietly and furnish long, dependable service.
This universally popular line is not limited to a few fast moving numbers for one make of refrigerator. It includes a comprehensive line of replacement parts for compressors in Copeland, Frigidaire, Kelvinator, Servel, Universal, Zerozone and others.
The Perfection line, however, is not confined to parts for compressors, but includes valves, fittings and many other essential replacements—and all are certified to excel.
PERFECTION REFRIGERATION PARTS CO.
(A division of Perfection Gear Co. Est. 1919)
HARVEY, ILLINOIS
PERFECTION Certified Replacement Parts for popular makes of refrigeration units
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MORE FEATURES OF DESIGN AND GREATER CAPACITY RANGE

FREON LINE VALVES TO 6-IN., STRAINERS AND DRYERS

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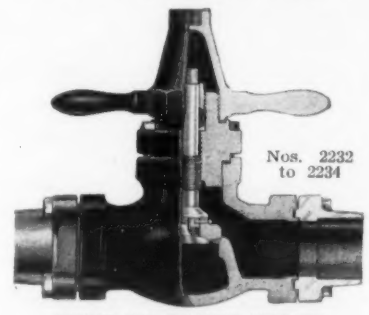
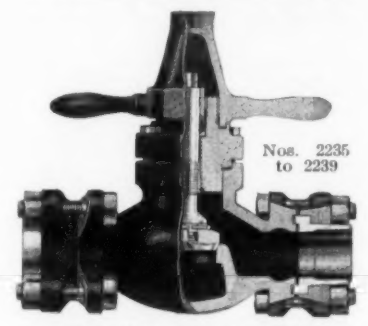


TYPE 223 GLOBE VALVE

with forged brass companion flanges



TYPE 223 GLOBE VALVE

with companion flanges and adapters

Has patented, rotating, self-aligning, tapered brass stem disc. **Resilient Freon packing.** Can be repacked under pressure. Inverted wing cap operates valve. Tongue and groove, recessed gasket joint under cap. Nos. 2235 to 2239 have brass adapters for soldering to copper tubing, or steel adapters for welding to steel tubing or screw end companion flanges for threaded pipe. Permit soldering or welding of pipe or tubing to flange without transmission of heat to valve seat. Flange construction enables easy removal from line. Other types of wing cap valves have screw ends or are furnished with Streamline fittings.

"Y" STRAINER

For Copper Pipe

Exceptional design. Negligible pressure drop. Easily removable screen. Large screen area. Light weight. Baffle prevents injury to screen. Trapping of oil can be entirely prevented by installing strainer on its side or in a vertical position. Strainer is furnished with 80 mesh screen for liquid line or 50 mesh for suction line.

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With Dispersion Tube

Copper plated steel flange construction for convenience in refilling. Distortion-proof flange makes tongue and groove recessed-gasket joint. Shell diameters: 2" to 4⅛". Dehydrant capacity: 13.5 to 230 cu. in. Available with flare or union solder type fittings; also Female I. P. S.

HENRY VALVE COMPANY

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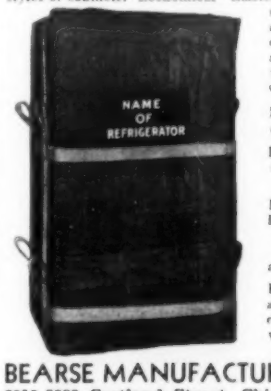
ADJUSTABLE PAD AND CARRYING HARNESS

FOR SAFE DELIVERY OF AUTOMATIC REFRIGERATORS

Pad and harness adjustable to many sizes and styles of cabinets. Economical—Efficient. Sturdily constructed, easily applied. Name of refrigerator attractively lettered on pad without charge.



Pad (Adjustable) $9.50 ea.

Harness (Adjustable) $6.00 ea.

Illustration at left shows type F adjustable harness and adjustable pad.

For other types, also individual carrying straps, write for full information.

BEARSE MANUFACTURING CO.

3815-3825 Cortland Street, Chicago, Illinois

The Buyer's Guide

Suppliers Specializing in Service to the Refrigeration and Air Conditioning Industries

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Showing America's Biggest Line of REFRIGERATION PARTS AND SUPPLIES

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AIR CONDITIONING AND COMMERCIAL

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We Carry a Most Complete Line of **Refrigeration Supplies**

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"The Leitner System" gives Cold Control —Foam Control in any Beer Cooler. Sensitive to 1° temperature change in beer coils. Can be installed and operated by anyone. For either single or multiple installations. "The Leitner System" is supplied ready installed in three Models of Coil Boxes—all sizes. Send for literature and prices.

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Type X

DELIVER YOUR REFRIGERATORS ON RUBBER

***The* DAYTON CARRIER TRUCK**

Will not mar — Speeds delivery

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Vol. 10—Sept. 6 to Dec. 27, 1933. (Serial Nos. 233 to 249.)
Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)
Vol. 12—May 2 to Aug. 29, 1934. (Serial Nos. 267 to 284.)
Vol. 13—Sept. 5 to Dec. 26, 1934. (Serial Nos. 285 to 301.)
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Please place my name on the list you are compiling.

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The Refrigeration Engineer's Manual

By S. L. Potts

Advantages & Disadvantages of Absorption System

Chapter 9 (Continued) — Absorption Refrigeration

Condenser is the same here as in any compression system. The condensing temperature of the ammonia gas must be above the temperature of the cooling medium used in the condenser, in order to have the heat flow out of the gas into the cooling medium. The head pressure generated in the generator must be raised until the condensing temperatures of the ammonia gas is above the temperature of the cooling medium.

Receiver is the same as in the compression system. It receives the liquid ammonia for storage until called for by the evaporating coils.

Evaporator coil is the same here as in the compression system. It gathers the heat from the refrigerated space and the products to be cooled and generated ammonia gas. The gas is drawn off to the absorber as explained under absorber and the cycle repeats.

Absorption system efficiency. For capacities of 50 to 100 tons capacity, the absorption system efficiency will equal the compression system. For capacities greater than 100 tons, the compression system is higher in efficiency. The driving unit, whether steam engine or electric motor, will increase in efficiency as the capacity increases, enabling the refrigerating system to operate at higher efficiency.

The compressor is more positive in its action in large capacity. The absorption system reaches its maximum limit at about 200 tons capacity. Compression system can be built up to 1,000 ton capacity without difficulty. The absorption system in units of small capacity have had many troubles in the past. Some have been overcome and many others, no doubt, will be improved, bringing the absorption system into more prominent use for small commercial and domestic use.

Absorption System Advantages

1. This system has no moving parts to cause wear or leakage. The strong liquor pump does move, but its operation is not considered a source of trouble in any way.

2. When a large amount of exhaust steam for heating the generator, and ample supply of cooling water at low cost is available, this system of refrigeration can be operated very economically.

3. The absorption system will produce very low temperatures.

4. The lower the suction temperature and the higher the head temperature, the more efficiently the absorption system operates.

5. This system operates in summer time on the same exhaust steam that is used in winter time for building heating—this permits a non-condensing steam power plant to operate winter and summer at best efficiency because the exhaust steam is used.

Absorption System Disadvantages

1. The absorption system does not lend itself to being forced for higher than rated capacities.

2. The system cannot be tested for leaks under air pressure unless a compressor is installed for this service.

3. The system cannot be emptied of ammonia without the services of a compressor.

4. The plant operation seems more difficult because pressures and temperatures are the only indications the operator has to guide him.

5. The water used in the aqua ammonia section must be free from dirt, scale, oil, or acids. A small quantiy of any one of these causes trouble.

6. Repair costs mount rapidly when the plant is forced for capacity output.

Liquid Sight Glass

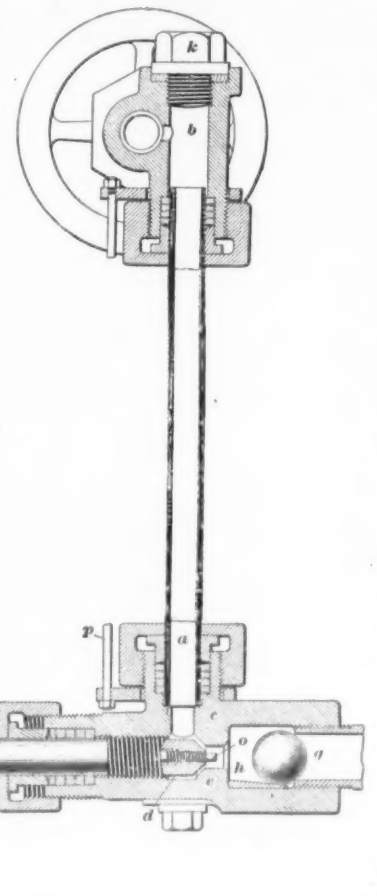

Fig. 80—The above diagram shows the construction of a liquid sight glass on a refrigeration system. The top section is taken at right angles to the lower section.

Absorption Plant Operation

If the plant is new it should be cleaned and dried as explained in the compression system. All the joints and connections made secure and packed. All valve stuffing boxes packed. If a compressor is connected to the system, the entire system should be tested under high pressure air.

Pump the system up to 150 lbs. air pressure. The pressure should remain fairly constant. If the pressure drops rapidly, look for some large leak. If the pressure drops slowly, test all likely places with soapy water watching for soap bubbles to appear.

If the system is tight it can then be emptied of all air. If a pump is connected, remove the air from the system and discharge air to atmosphere. If no pump is connected to the system, the air has to be purged off as the ammonia is charged into the system. This requires that the system be purged until all the air is removed.

Charging. The charging connection is usually on the liquid outlet line from the receiver to the evaporating coils and just before the expansion valve. Another charging connection is placed on the suction side of the liquer pump to furnish the power needed to empty the ammonia supply tank.

Charging is complete when all the different pieces of equipment are operating in the system under the pressure and temperature and the quantity of ammonia liquor, ammonia liquid or ammonia gas that each unit of the system requires for correct operation of the plant and the receiver is one-half to two-thirds full of ammonia liquid.

Starting the plant after a short shut down as for overnight shut-down.

1. Get the cooling water circulating on or through the condenser, absorber, rectifier, and weak aqua cooler, if there is one. Inspection should be made to insure the proper circulation of the water and that each unit has attained its proper operating temperature and pressure.

2. Start the aqua ammonia pump. Open the weak liquor return valve to the absorber. Check the flow of aqua ammonia between the absorber and the generator.

3. Slowly open the steam valve that allows steam to flow into the generator. Gradually increase the steam into the generator until the head pressure is built up to what is required for condensing. Three lbs. pressure is usually required when exhaust from engines and pumps is used. When live steam is used, the pressure may be about one-third of the pressure in the condenser.

Table 12—Properties of Aqua Ammonia Baume Readings For Temperature Above 60°

The specific gravity of aqua ammonia changes with the temperature at which it is measured with the hydrometer. The readings are too high if the temperature of the ammonia is over 60° F., and too low if under. To ascertain the exact strength of ammonia at 60° F., make the corrections for temperature in accordance with the table, thus: 26½ ammonia, measured at a temperature of 80° F., is equal to 25¼ ammonia at a temperature of 60° F.

Baume Deg.	Temperature of Aqua Ammonia in Degrees F.															
	60°	66°	67°	68°	72°	74°	76°	78°	81°	84°	88°	90°	92°	95°	96°	100°
18	18	..	..	17¾	..	..	17½	..	..	17¼	..	..	17	..	..	16¾
18¼	18¼	..	..	18	..	..	17¾	..	..	17½	..	..	17¼	..	..	17
18½	18½	..	..	18¼	..	..	18	..	..	17¾	..	..	17½	..	..	17¼
18¾	18¾	..	..	18½	..	..	18¼	..	..	18	..	..	17¾	..	..	17½
19	19	..	..	18¾	..	..	18½	..	..	18¼	..	..	18	..	..	17¾
19¼	19¼	..	..	19	..	..	18¾	..	..	18½	..	..	18¼	..	..	18
19½	19½	..	..	19¼	..	..	19	..	..	18¾	..	..	18½	..	..	18¼
19¾	19¾	..	..	19½	..	..	19¼	..	..	19	..	..	18¾	..	..	18½
20	20	..	19¾	..	..	19½	..	..	19¼	..	19	..	..	18¾	..	..
20¼	20¼	..	20	..	..	19¾	..	..	19½	..	19¼	..	..	19	..	..
20½	20½	..	20¼	..	..	20	..	..	19¾	..	19½	..	..	19¼	..	..
20¾	20¾	..	20½	..	..	20¼	..	..	20	..	19¾	..	..	19½	..	..
21	21	..	20¾	..	..	20½	..	..	20¼	..	20	..	..	19¾	..	..
21¼	21¼	..	21	..	..	20¾	..	..	20½	..	20¼	..	..	20	..	..
21½	21½	..	21¼	..	..	21	..	..	20¾	..	20½	..	..	20¼	..	..
21¾	21¾	..	21½	..	..	21¼	..	..	21	..	20¾	..	..	20½	..	..
22	22	21¾	..	..	21½	..	..	21¼	..	21	..	20¾	..	..	20½	..
22¼	22¼	22	..	..	21¾	..	..	21½	..	21¼	..	21	..	..	20¾	..
22½	22½	22¼	..	..	22	..	..	21¾	..	21½	..	21¼	..	..	21	..
22¾	22¾	22½	..	..	22¼	..	..	22	..	21¾	..	21½	..	..	21¼	..
23	23	22¾	..	..	22½	..	..	22¼	..	22	..	21¾	..	..	21½	..
23¼	23¼	23	..	..	22¾	..	..	22½	..	22¼	..	22	..	..	21¾	..
23½	23½	23¼	..	..	23	..	..	22¾	..	22½	..	22¼	..	..	22	..
	60°	64°	65°	68°	70°	72°	75°	76°	80°	84°	85°	88°	90°	92°	95°	96°
23¾	23¾	..	23½	..	23¼	..	23	..	22¾	..	22½	..	22¼	..	22	..
24	24	..	23¾	..	23½	..	23¼	..	23	..	22¾	..	22½	..	22¼	..
24¼	24¼	..	24	..	23¾	..	23½	..	23¼	..	23	..	22¾	..	22½	..
24½	24½	..	24¼	..	24	..	23¾	..	23½	..	23¼	..	23	..	22¾	..
24¾	24¾	..	24½	..	24¼	..	24	..	23¾	..	23½	..	23¼	..	23	..
25	25	..	24¾	..	24½	..	24¼	..	24	..	23¾	..	23½	..	23¼	..
25¼	25¼	..	25	..	24¾	..	24½	..	24¼	..	24	..	23¾	..	23½	..
25½	25½	25¼	..	25	..	24¾	..	24½	24¼	24	..	23¾	..	23½	..	23¼
25¾	25¾	25½	..	25¼	..	25	..	24¾	24½	24¼	..	24	..	23¾	..	23½
26	26	25¾	..	25½	..	25¼	..	25	24¾	24½	..	24¼	..	24	..	23¾
26¼	26¼	26	..	25¾	..	25½	..	25¼	25	24¾	..	24½	..	24¼	..	24
26½	26½	26¼	..	26	..	25¾	..	25½	25¼	25	..	24¾	..	24½	..	24¼
26¾	26¾	26½	..	26¼	..	26	..	25¾	25½	25¼	..	25	..	24¾	..	24½
27	27	26¾	..	26½	..	26¼	..	26	25¾	25½	..	25¼	..	25	..	24¾
27¼	27¼	27	..	26¾	..	26½	..	26¼	26	25¾	..	25½	..	25¼	..	25
27½	27½	27¼	..	27	..	26¾	..	26½	26¼	26	..	25¾	..	25½	..	25¼
27¾	27¾	27½	..	27¼	..	27	..	26¾	26½	26¼	..	26	..	25¾	..	25½
28	28	27¾	..	27½	..	27¼	..	27	26¾	26½	..	26¼	..	26	..	25¾

Liquid Receiver

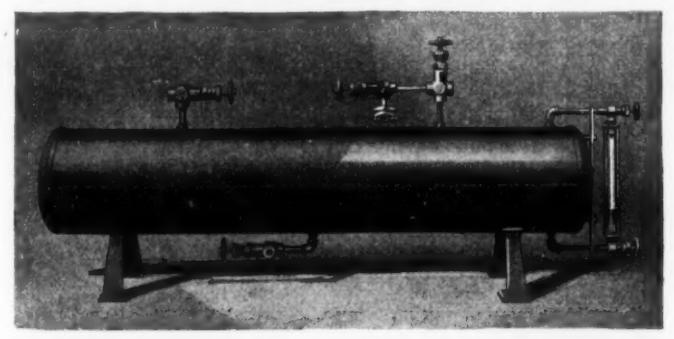

Fig. 83—Receiver for liquid refrigerant in absorption system.

4. When the generator pressure is up to or slightly greater than the condenser pressure, open valve between generator and rectifier.

5. Start the evaporating coils by opening the expansion valve to the known setting where the proper operation takes place. If the proper setting of expansion valve is not known, open the valve a slight amount slowly and watch the results. Increase the expansion valve opening until the evaporating coils are getting the correct amount of ammonia liquid for proper operation of evaporator.

Shut down the plant for short period, overnight or equal time. The operations can be performed in the reverse order starting at No. 5 and proceeding to No. 1.

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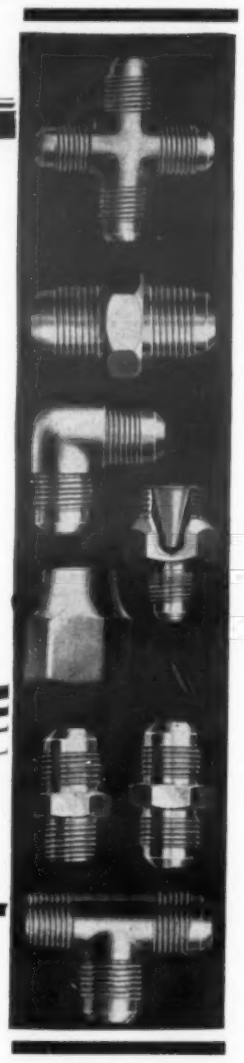

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